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More Outlets Per PDU, But In A Smaller Space

Server Technology High Density Outlet Technology Is A Unique Style Of IEC Standard C13 & C19

What is your data center's greatest challenge? Chances are, your list will likely include a proliferation of 1U equipment, growing rack heights, and a lack of data center real estate.

"Data centers are packing more equipment into a smaller amount of space," says Travis Irons, director of engineering at Server Technology. They need a way to power that equipment, while still being cognizant of overall efficiency.

The new Server Technology High Density Outlet Technology (HDOT) provides just that, with a way to power racks full of equipment yet still conserve rack space and improve airflow, power efficiency, and cable management.

Technological Boost

"HDOT really gives us a technological boost when space is at a premium—and it seems to almost always be at a premium," Irons says.

With HDOT, he says, Server Technology developed its own style of C13 and C19 outlets that removes the excess material in the housing and leaves only the core functional part of the outlet. This unique design allows for the maximum possible outlet density in a PDU.

Consider that the most common rack size is 42U, Irons says. Intelligent PDUs utilizing HDOT can hold up to 42 C13 outlets in a 1.75-inch-wide package—that's more than 20% smaller than the typical 2.2-inch width of a comparable PDU using standard outlets.

"That narrowness allows you to put two PDUs side by side in almost any rack," Irons says, "and still leave room for airflow or additional cable runs."

Three Base Models

Server Technology will initially offer High Density Outlet Technology in three base models in its Smart, or networked, PDU family: a single-phase 30-amp product in either 208V or 230V; a three-phase Delta 208V 30-amp model; and a three-phase Wye 400V or 415V product available with 30 or 32 amps. All three are 70 x 1.75 x 2.25 inches.

The smaller space doesn't sacrifice quality. The HDOT outlets are made with high temperature, high flame rating, high durability materials. They also have the highest possible native retention plug holding force and support Server Technology's LockedIn positive locking cord solution if you need additional retention.

PDUs with Server Technology's High Density Outlet Technology (front) can fit more outlets in a smaller space than traditional PDUs (back).

Build Your Own PDU

You can customize the base HDOT models into one of more than 200 outlet variations with Server Technology's Build Your Own PDU tool. Simply answer a few questions about your plug type, outlet requirements, and networking needs.

For example, Irons says, each power strip has three outlet modules that are customizable. Each module can be configured to have from zero to five C19 outlets and seven to 14 C13 outlets.

"With six different outlet modules, you'll be able to mix and match where you want them in your PDU," Irons says. "This will allow customers to put the right type of outlet directly adjacent to the equipment," he says.

"We've never built products to be configurable this way before." Customers will benefit from a more efficient, space-saving product that meets their exact specifications. P

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COMPANY TO WATCH

Backup & Failover Without The Worry

Rely On A Hosting Operator Such As Mainstream Technologies To Handle Best Practices When It Comes To Physical Infrastructure, Software & More

You're likely stretched pretty thin when it comes to tasks and priorities. Finding the time to devote to backup and recovery may not make the top of the list, but it's important work in case of system failure, which will, after all, happen at some point.

"Causes range from the more mundane infrastructure failures . . . to failures of previously unidentified single points-of-failure . . . to 'domino' failures caused when the remaining system components do not respond appropriately," says Mainstream Technologies President John Burgess.

It's these types of situations where a failover site such as Mainstream Technologies can prove its worth. You'll benefit from knowing you're protected in case of disaster, and you can dedicate in-house resources to other important work.

When choosing a provider, one important element to consider is whether it has expertise and resources devoted to following and implementing best practices. And, if it does, what best practices it follows.

Burgess says the partner should have a formal and iterative risk assessment process to identify threat sources and mitigate risks, and a formal incident and disaster response plan to lessen the impact of events.

When it comes to the provider's physical infrastructure, be sure it conducts routine preventive maintenance, follows warranty and replacement schedules, and has consistent and controlled processes for applying software and firmware patches and upgrades. Also ensure it regularly tests system and infrastructure components.

In the end, Burgess says, you can leverage in-house expertise to find a partner and deploy the solution, rather than devoting time and effort to operate and maintain the second site. P

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A leading supplier of document filters and general enterprise and developer text retrieval software for instantly searching terabytes of data, dtSearch announces a new version of its product line. The new version enhances options for dtSearch Engine developers embedding the document filters.

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A Wallmount Space Saver

If Your Company Is Short On Space, The RackSolutions 15U Wall Mount Rack Can Help With Your Server & Networking Needs

Let's say you are in an office or business where space is at a premium. You need a place to store servers and other networking gear and keep them safe, but you don't have a data center, and finding the floor space for a regular rack or cabinet isn't easy.

It's the ideal environment for the RackSolutions 15U Wall Mount Rack, which can be mounted in an office, back room, or virtually any other location.

Because the rack doesn't require floor space, it stays out of the way while providing easy, centralized access to servers and other equipment. It has a durable, heavy-duty steel construction with a powder-coated black finish and comes with all the necessary mounting hardware.

The 15U Wall Mount Rack offers several features unique to the market, says Rodger Baldwin, executive account manager. A Plexiglas front door lets you see and monitor equipment inside the rack and swings open to provide quick access.

At 15U tall and 24 inches deep, the rack is taller and deeper than other wallmount products on the market. That extra space means there's plenty of room to access power and cables on the backs of switches and other equipment.

"You can easily plug and unplug devices and route cables around the back of equipment," Baldwin says, plus mount equipment either horizontally or vertically. In fact, one customer noted that "there's U space all over the place," he says.

The extra depth, plus the rack's side panels with an open top and bottom, allow for plenty of heat exhaust and airflow. If needed, you can enclose the top of the cabinet with optional filler panels. P

RackSolutions 15U Wall Mount Rack

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- Added depth makes it easy to access cables in back of rack
- Optional filler panels for top

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FEATURED PRODUCT

Backup In Virtual Or Hybrid Environments

Paragon Protect & Restore Offers A Single Centralized Console, Regardless Of The Storage Environment

With data center managers struggling to meet backup and restore demands, virtual or hybrid physical/virtual solutions are a likely option. But such environments can bring a whole host of new issues.

It's those types of environments Paragon Software had in mind when developing Paragon Protect & Restore (PPR).

"Unlike most of our competitors, Paragon decided not to 'patch' our previous technology by simply bolting on centralized management and a new GUI," says Paragon Software President Tom Fedro. Instead, Paragon developed a new-generation backup/disaster recovery product from scratch.

The end result is a single centralized console to back up, restore, and manage your data. "Most competitors use different products," Fedro says. "Even if they are combining them under the cover of a common GUI, they're still two different products and technologies."

Paragon Protect & Restore offers agentless VMware backup and replication. You'll benefit from quick replications and an ESX Bridge that provides direct access to the ESX or vSphere infrastructure.

PPR supports any VMware ESX/ESXi 4.xx, ESXi5.xx, or vSphere configuration. Supported virtual machines include any Windows, Linux, or other OS guest supported by VMware, and supported physical machines include any Windows OS machine since Windows XP.

The Paragon Virtual Hard Drive, or pVHD, format makes storing backups of virtual and physical machines quick and easy, efficiently handling incremental backups, data deduplication, and synchronization. P

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Easy Labeling On The Go

Brady BMP®41 Portable Printer Offers Both Die-Cut & Continuous Labels For Use In A Variety Of Datacomm & Electrical Applications

Anyone who has spent time labeling cables, patch panel strips, faceplates, or other equipment knows what a hassle it can be. You print the labels, cut them, and make sure they stay in sequence only to get to a job site and find out you've forgotten or lost a label or smeared the printed text.

It's those types of headaches that the Brady BMP®41 portable label printer helps avoid.

The printer is unique in its ability to print both continuous and die-cut labels, says Matt Luger, Brady's regional product specialist for printers.

The BMP41's ability to print die-cut labels that are pre-cut and pre-spaced inside a cartridge eliminates the time- and money-wasting issues associated with continuous printers while still offering continuous labels for certain applications.

The printer can handle any labeling need, including flags, wraps, strips, and small labels for both indoor and outdoor use. And it is easy to use—it automatically recognizes the label installed and defaults to the correct rotation, format, size, and font, with the ability to override any default settings.

Rubber guarding, bumpers, and a grab-and-go grip ensure the BMP41 can handle field and mobile use, including drops and bounces. An optional magnet easily attaches to the BMP41, so users can affix the printer to a metal cabinet or panel.

Brady offers the BMP41 without the expensive investment typical of other die-cut printers. It costs just $299, including the printer, long-life NiMH battery, charger/AC adapter, one label cartridge, and a USB cable.

"Never before has there been a printer at a sub-$300 price point that allowed users to get this full, robust set of labeling capabilities and labeling muscle," Luger says. P

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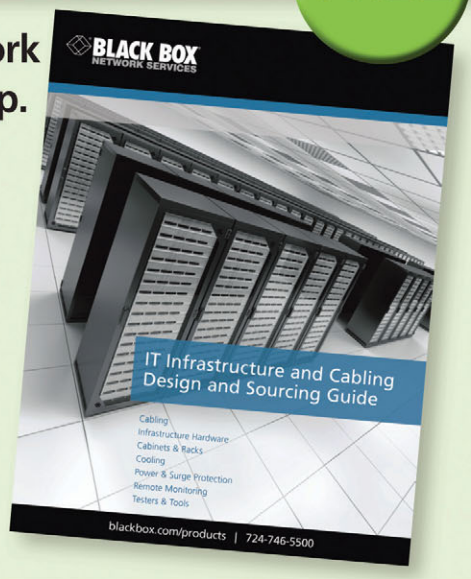

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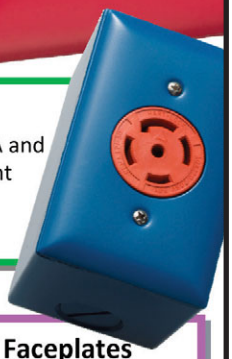

Why Color Coding is Important

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- Identify and isolate power sources
- Makes it easier to service equipment

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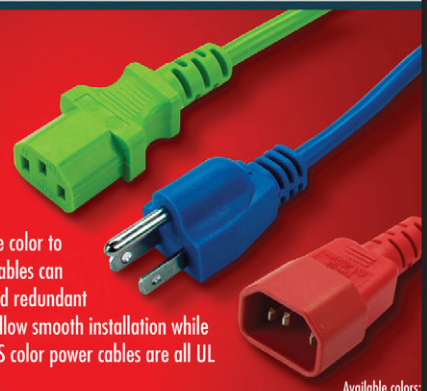

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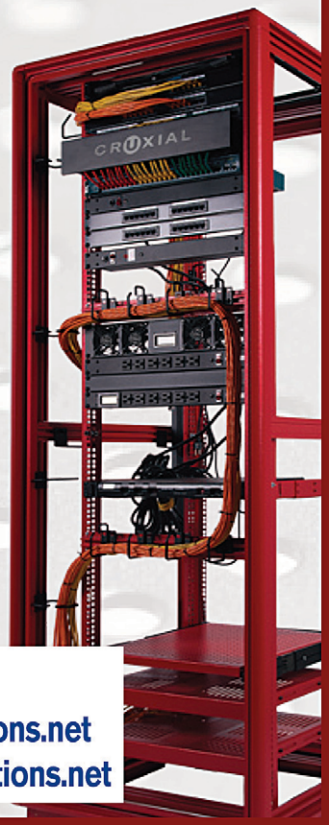

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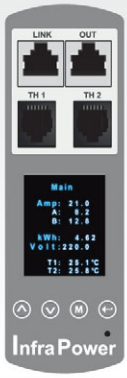

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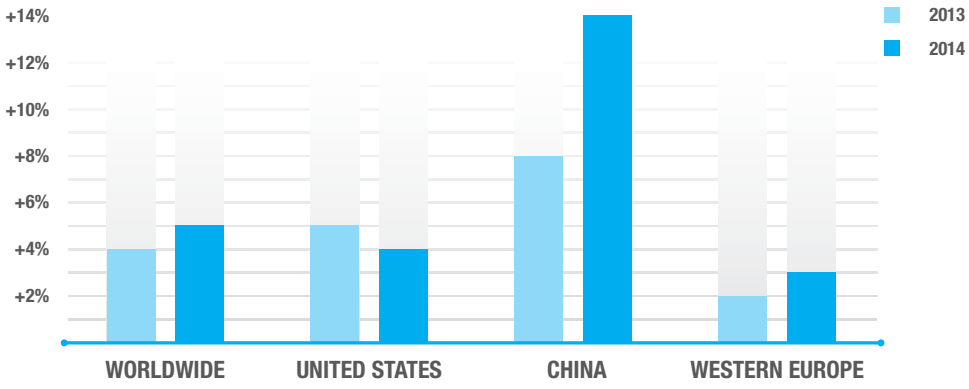
IDC Says Emerging Markets Slowdown Won't Impede 2014 IT Spending

New research from IDC's Worldwide Black Book projects that IT spending around the globe will increase by 4% this year, which is down from 5% in 2012—this drop is due in part to a weak pace of growth in emerging global markets such as China, India, and Russia. The U.S. market has proved to be resilient this year, however, with enterprise spending predicted to increase 5%. Here's how 2013 and 2014 compare among four market segments in IT spending growth:



Future Data Centers Will Follow Eight Strategies, Gartner Says

Data center development approaches must move beyond balancing risk and cost in the next five to 10 years and begin to incorporate agility, Gartner reports. It recommends eight areas of focus for IT organizations to keep in mind.

Start deploying processor, memory, and power-efficient technologies.
Prepare to implement new process architectures and use energy-saving processors.

Move toward a balanced architectural topology and delivery model.
Cloud-based hosting will increase in the next five years. Managed hosting, data center outsourcing, and remote infrastructure management will converge.

Invest in operational processes and improved tools. Enterprise data centers should focus on security, data management, and mapping business-to-IT processes.

Integrate disaster recovery and business continuity into your core data center strategy. Disaster recovery and business continuity must be part of a top-down strategy and not simply a specialized project.

Manage capacity growth through data analysis. Expect demand for storage and backup systems to increase and, as a result, for the multiplication of new workplace roles to occur.

Plan for operating system and application changes. As large data centers move away from UNIX and embrace the Linux platform, Gartner says IT organizations should start UNIX application migration by 2014.

Make consolidation and rationalization a continuous change program. Plan to stay on top of data center consolidation consistently rather than treating it as a singular change.

Modernize data center facilities. Data center managers should prepare to upgrade their facilities to address energy consumption changes, software deployment, and new hardware.

More Companies Going Global But Unable To Keep Up

The Hackett Group's most recent "Book Of Numbers," which examines performance trends within 100 companies, reports that an increasing number of companies are expanding their product, service line, and delivery reach on a global scale. Many of those companies, however, lack the necessary automation, as well as deep insights into key supply, demand, distribution, and risk factors, that are necessary for optimal success, the study indicates. "Companies understand that tapping into emerging markets is a key to success in the future," says Sean Kracklauer, president of Advisory and Research Services for Hackett. "But, it's pretty obvious that most companies simply don't have the 'global DNA' that they need to do this effectively." Kracklauer says that leaders in globalization understand they must address numerous issues, including governance, acquisition of service delivery talent, and development of plans for insourcing vs. outsourcing.

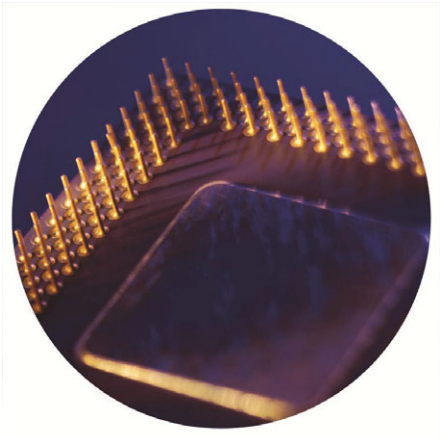
Fear, Uncertainty, Doubt Cause Security Distractions

CIOs, CISOs, and senior business executives are focusing more on technical security than enterprise risk management and risk-based information security, according to Gartner's 2013 Global Risk Management Survey. Fear, uncertainty, and doubt, or FUD, is what Gartner analysts are blaming for IT management's "reactionary and highly emotional decision-making;" failure to

enforce risk-based disciplines could leave companies unprepared. Gartner's examples of risk management program activities include technical security, risk-based information security, IT operations risk, operational risk, and enterprise risk management.

Data Management & Analytics To Drive Software Spending

The latest research from IDC's Worldwide Semiannual Software Tracker reveals that structured data management software and data access, analysis, and delivery solutions will see an 8% compound annual growth rate (CAGR) from 2012 to 2017, thanks to the need to gain insight into customer behavior and product reliability. The Tracker's findings also reveal a 6% CAGR for enterprise applications, including CRM, ERM, SCM, as well as operations and manufacturing software.



Global Processor Shipments On The Rise Thanks To Mobile Devices

Sales to smartphone and tablet manufacturers drove growth in processor shipments this year, according to a report from IHS. Bolstered by the strong sales of smartphones and tablets, worldwide processor shipments are predicted to top out at 1.5 billion units by the close of this year, a moderate increase compared to 1.21 billion units in 2012. In contrast, microchip shipments in the PC sector were down this year as PCs continue to compete with popular handsets and tablets.

Selective Mobile-Only Users Are The True Mobile-Only Audience

A redefined subset of the mobile market called "selective mobile-only" users chooses mobile devices for certain activities such as social media, searches, or music, according to the "Redefining Mobile-Only Users; Millions Selectively Avoid The Desktop" report form eMarketer. This research may determine how mobile marketing strategy shifts from being an additional channel to becoming a primary approach or "mobile-first." While true "mobile-only" users comprise 6% of U.S. Internet users, based on platform research from comScore, on average, 52% of Internet users go online using both personal computers and mobile devices.

Smartglasses To Increase Efficiency, Profits

Gartner projects that by 2017 smartglasses will boost workplace efficiency high enough in field service to increase annual profits by $1 billion. "In the next three to five years, the industry that is likely to experience the greatest benefit from smartglasses is field service," says Angela McIntyre, research director at Gartner. "The greatest savings in field service will come from diagnosing and fixing problems more quickly and without needing to bring additional experts to remote sites." For example, healthcare workers will be able read how-to instructions and view illustrations while performing medical procedures. Video recording, streaming, and sharing will also make remote training and specialized tasks possible for real estate appraisers, construction inspectors, and couriers.

What Big Data Means To Senior Marketers & Ad Execs

IT managers may have their fingers pressed firmly on the pulse of developments in big data, but it's also worth knowing how advertisers and corporate marketers process big data. The key findings of a Forbes Insights and Rocket Fuel survey reveal that 92% of companies that always or frequently make use of data indicate that they meet or exceed their goals. In fact, advertising and marketing companies that use data at least 50% of the time see results in ROI, customer interactions, and customer behavior insights. However, more than half of agency and company senior execs still don't know how to define big data.

Smartphones Have Two Record Quarters In A Row

The third quarter was a record one for smartphone shipments, according to IDC, with 258.4 million smartphones shipped. That represents 38.8% year-over-year growth as well as a 9% increase over the second quarter this year, when 237 million smartphones shipped. What is behind the sharp rise? "Price points have declined significantly, driven largely by low-cost Android solutions," says Ryan Reith, program director for IDC's Worldwide Quarterly Mobile Phone Tracker. "This has helped China to become one of the fastest growing smartphone markets in the world, accounting for more than one third of all shipments last quarter." Looking ahead, Ramon Llamas, research manager with IDC's Mobile Phone team, says, "we anticipate strong momentum going into the fourth quarter, and another record quarter and year in the worldwide smartphone market."

Maintain PDUs, UPSes & Other Power Equipment

Put A Preventive Maintenance Plan In Place & Know Your Employee Experience Level

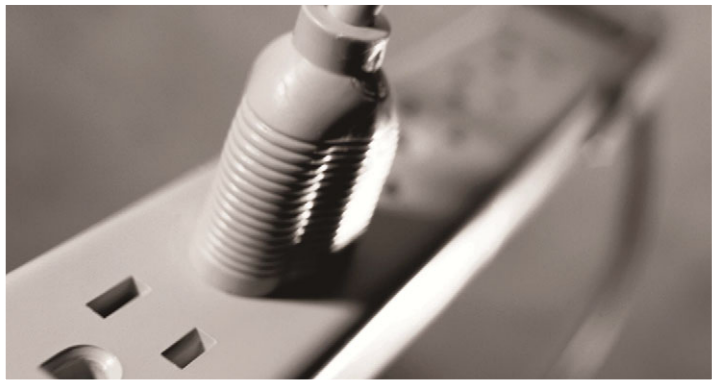
Maintenance is essential in every area of the data center, but some equipment can get overlooked. PDUs, UPSes, and other pieces of power equipment can get lost in the day-to-day maintenance flow but do require some attention when it comes to cleaning and testing. It's important to not only know when and how you should perform maintenance on power equipment, but also whether your IT employees are up to the task.

PDU Maintenance

"PDUs, for the most part, are easy to maintain," says Laura Viars, account manager at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net). "Most of the work can be done solely by visual checks."

For instance, she says it's important to make sure the PDU and the space around it are clean. You should check to make sure your input cables don't have nicks or holes in their insulation and that those same cables aren't "overly taut or poorly managed," Viars says. Don't forget to also inspect any LCD or LED displays on your power equipment.

After visually inspecting PDUs, you can also take advantage of software and other devices to maintain your power equipment. Viars recommends using some kind of network-connected monitoring software that will "allow you to pinpoint any PDUs with non-functioning receptacles. She also adds that some companies can implement a more involved approach by using infrared scanners. "These scans can identify potentially troublesome hot spots," Viars says.



UPS Maintenance

UPSes are similar to PDUs in that they require some level of cleaning, including removing dust and debris, and you also need to check displays, if applicable. But UPSes also require unique attention when it comes to batteries.

"The most typical maintenance for UPSes is replacement of the internal batteries," Viars says. "These batteries are usually only slated to last a few years, but there are various factors that could make them reach end of life more quickly, such as corrosion or defects. Internal batteries should be replaced regularly."

Automatic transfer switches also need to be checked on a regular basis not only to ensure proper functioning, Viars says, but also because contacts are damaged every time an automatic transfer is made. As with PDUs, UPSes and automatic transfer switches can also benefit from infrared scanning, because everything that deals with electricity and power in your organization may be prone to overheating. Pinpointing these issues can help you focus your cooling efforts and increase the efficiency of your equipment.

Set Up & Stick To A Maintenance Schedule

Every data center manager understands how important it is to maintain equipment, but it's also crucial to know how often you should perform certain tasks. According to Rich Feldhaus, product manager

Preventive Maintenance Is Key

Maintenance is all about preventing future issues so you aren't caught off guard. There's nothing worse than assuming everything is running correctly and then encountering an unexpected failure. It's much better to have a plan that can prevent those issues rather than to constantly find yourself performing damage control.

"While no amount of preventative maintenance can 100% prevent a failure from occurring, keeping a maintenance schedule in place can minimize a potential occurrence," says Laura Viars, account manager at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net). "Whether you perform your own maintenance or have a professional do it for you, make sure you stick to a schedule. If you are unsure with what frequency you should be performing maintenance, the manufacturer should be able to provide insight."

at Tripp Lite (773/869-1234; www.tripplite.com), PDU load levels should be monitored continuously to ensure the PDU and protected main input circuits are well within their maximum capacity. When it comes to UPSes, he says that those systems "should be tested at least monthly to ensure batteries and inverter systems are functioning properly."

Viars agrees, but also adds that in addition to continuous maintenance and checkups, you also need to submit PDUs and UPSes to yearly preventive maintenance at the absolute minimum, but she recommends a semi-annual or quarterly cycle. You should also check to see whether your manufacturer offers a preventive maintenance contract, because some will actually visit your data center for quarterly or semi-annual scheduled maintenance visits, Viars says. And don't hesitate to reach out to a third-party consultant to develop a proper maintenance schedule.

Can You Perform The Maintenance Yourself?

Some IT teams prefer to perform maintenance themselves if at all possible, but it's important to know your limits. "Some tasks, such as visual checks, are very easy to perform and can typically be completed by data center personnel with no issues," Viars says. "Infrared scanning can also be performed by data center employees, assuming they have the required equipment on hand."

UPS maintenance, though, should be performed by the manufacturer or a contracted representative of the manufacturer, Viars says. A manufacturer or representative will help ensure nothing is overlooked specific to the brand. Plus, it will use appropriate replacement parts and take advantage of any potential warranty issues.

Feldhaus says that tasks involving establishing additional electrical capacity, branch circuits, or hard-wiring power distribution equipment and UPS systems are tasks generally best performed by either onsite or hired electrical staff.

The amount of PDU, UPS, and power equipment maintenance you can or should perform depends on the expertise of your employees. If you lack that experience, make sure you reach out to a skilled professional, because you don't want to miss something or cause any damage, Feldhaus says. P

Plan For The Future

In addition to maintenance, you also need to think about how your data center's power needs will change in the future. "Having an ongoing plan for providing additional electrical capacity as your data center power consumption levels change over time is crucial," says Rich Feldhaus, product manager at Tripp Lite (773/869-1234; www.tripplite.com). "Clear upgrade paths provide ready-to-implement plans for power upgrades and modifications to most efficiently accommodate future growth and equipment configuration updates."

As you add new pieces of equipment to your data center and the power supplies to support them, you need to incorporate them into your maintenance plan. You also need to monitor how different pieces of equipment affect the others around them, which will help inform your maintenance plan.

BONUS TIPS:

Keep It Clean

Laura Viars, account manager at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net), says that cleaning "should be a given, but any amount of dust or clutter piling up on or around your power products can cause issues." Cleaning can't be an afterthought. Make sure the equipment and area around it is clear of debris and don't forget about cable management. You don't want something to accidently come unplugged, plus clutter can make it difficult to add new components.

Document Everything

Viars says that documentation applies to every maintenance facet of the data center. Just like you log in information every time you make a change to a server, network, or storage device, you need to do the same thing whenever you perform maintenance. "If you fix or replace anything, document it. If something fails, document it. If you have someone come onsite and perform maintenance, document it," she says. Recording when maintenance is performed will help you better follow your schedule and eliminate redundant tasks.

New Network Technologies Open New Possibilities

Simplify Network Management & Configuration With Automation & IT Training

THE BUZZ THAT software-defined networking, or SDN, is generating isn't hard to detect, largely due to the benefits it is purported to offer, including simplified network management and configuration and obtaining a complete view of the network and performance. Other network-related technologies are also generating enthusiasm. The following details several examples.

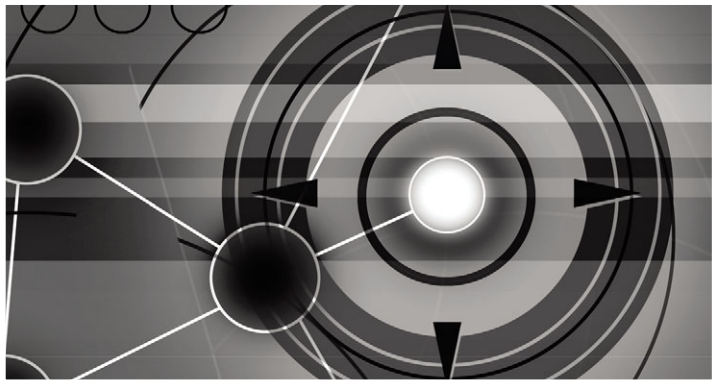
Recognize The Potential

SDN is often equated to network virtualization in the sense that SDN is described as providing an abstraction layer for the network by removing intelligence from the hardware layer and shifting it to the software layer. Related benefits include obtaining a unified view of the entire network, easier provisioning, better performance, faster application and service deployment, and automation abilities.

Alan Weckel, Dell'Oro Group vice president, believes SDN's potential is great. "The number of applications in the data center continues to grow exponentially," he says. To control the growth, network configuration and management must become more automated so that the human IT resources can scale at the same exponential rate, he says.

SDN and the process of network vendors automating control and configuration should enable SDN to live up to the hype for simplifying network management and configuration, Weckel says

Tim McElligott, senior industry analyst at Frost & Sullivan Stratecast division, says while management and/or configuration of multivendor networks is never simple, to the extent network equipment makers open their systems to a central and open controller and new interface protocols (such as OpenFlow) are adopted, "networks should become more malleable and conducive to the real improvements network operators are looking for." These include programmability, automation, and availability to the open-source community in order to bring new, tailored services to market quicker.



Network management system providers are now retooling solutions to better serve SDN environments, including developing correlation engines that analyze inputs from various fault management, performance management, service quality management, and customer experience systems, McElligott says. Others are consolidating their portfolios of these systems into one consolidated service-assurance platform.

Beyond SDN

Another newer network technology worth noting is network functions virtualization (NFV), which "has both data center and network implications," McElligott says.

NFV is described as offering a new approach for designing, deploying, and managing networking services by separating network functions from proprietary hardware to enable them to run in software. McElligott says as network elements are virtualized, they may move into data centers vs. central offices with IT/data center managers managing them.

"NFV has huge economies-of-scale impacts on

A Case For Network-As-A-Service

The benefits network-as-a-service (NaaS) can provide enterprises for simplifying network management and configuration come back to the "age-old argument around managed services," says Dell'Oro Group Vice President Alan Weckel.

One component of NaaS tied to user access is successfully showing it can be offered as as-a-service, Weckel says. "The data center network and the cloud implementation become interesting when used as an as-a-service. Security, data location, and control are lost or trusted by an outside provider and are negatives to adoption. But the scale and need not to have the expertise in-house are positives," he says.

data center operations, and managing virtual applications and servers in an on-demand environment, such as cloud, will require new skills," he says.

Jim Rapoza, Aberdeen Group senior research analyst, says the transition to IPv6 also deserves attention, as it must happen before IPv4 addresses run out. Overall, Rapoza says it's important to note each new technology transforms others. "So virtualization was changed by cloud, and communication was changed by mobile, and cloud is being changed by SDN, etc."

Such occurrences basic-ally turn "the old technology that you thought you had a handle on into a brand new technology that you have to deal with," he says.

Train Well

Though these technologies are still emerging, IT should seek knowledge and training now. Weckel says the key to successful IT is embracing technologies IT isn't familiar with. The growth in applications and use of SDN and the cloud will "require the retraining and transition of staff to be successful," he says. "This is often the most challenging piece of IT, as humans resist change; hardware does not."

McElligott says IT is "winning the war with network operations as more network technologies become software entities on servers" in IT departments, but IT can still benefit from learning about networking at the carrier level. Better education on open source and the impact of opening various network elements to third-party developers is also worthwhile.

Look Ahead

Though self-optimizing networks (SONs) are currently being developed for radio access networks, McElligott says, if they prove valuable and reliable, SON will undoubtedly be extended to other networks, including enterprise networks. "Parameter-based SON eliminates some of the monitoring, maintenance, and reconfiguration activity in network management," he says.

In other areas, McElligott says, the trends SDN is influencing in terms of correlation and consolidation will be positive developments even in non-SDN environments, he says.

Overall, a reliable end-to-end view of network performance, particularly in real time, "is still difficult to achieve and is the primary barrier to implementing some of the emerging remedies to complex network management," McElligott says.

Prepare To Be Patient

Aberdeen Group Senior Research Analyst Jim Rapoza says SDN could "radically alter network configuration and management," but he's not certain it will ultimately simplify it. Some tasks, especially in virtualization management, will be greatly simplified, he says.

As people start to explore SDN's full potential, especially on the programmability side, "we'll start to see things in networking that have never existed," which will open new opportunities and capabilities but probably make management and configuration more complex initially, he says.

BONUS TIPS:

Know The Need

Some managers realize having an end-to-end view into network performance is good but they aren't sure why. "If you only see the WAN or the data center, you're missing huge pieces of your overall performance ecosystem," says Aberdeen Group Senior Research Analyst Jim Rapoza. To understand network and application performance entirely, managers need visibility in all areas, including storage, servers, the network, WAN, cloud, carrier networks, devices, and applications.

Open Up

One network trend with promise for helping simplify management and configuration, Rapoza says, is "the move to open up networking devices to better integration through things like adopting open APIs or even using traditional RESTful technologies for interoperability." He says the more that networking devices and software can communicate and talk to each other, the better the capabilities for increased network visibility and administration. Vendors in the networking and monitoring space, he says, are using open APIs to "make it easier to access their network data and information and do deep integrations."

What To Do After A Data Breach

Minimize The Damage By Making Sure Your Enterprise's Reaction Is Prompt, Proper

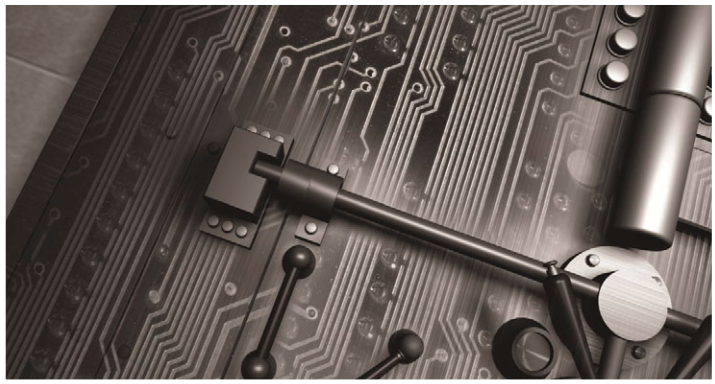
With data breaches, it's often a question of when, not if. That said, in terms of preparing for how to react to one, enterprises have all sorts of options, including not-so-advisable ones that could only make matters worse in the way of inviting potentially crippling fines and lawsuits, losing customers and partners, and damaging the organization's reputation—all of which the company may not recover from if serious enough.

Such an outcome doesn't have to be the case, however, as enterprises can do much to put themselves in a position to promptly react to a data breach and curtail the resulting damage. Here's how.

Factor In The Factors

The best first step any enterprise can take concerning data breaches is becoming familiar with what's at stake if it doesn't prepare.

For example, in a recent study the Ponemon Institute conducted via interviews with more than 1,400 individuals from 277 global organizations in nine countries, U.S. organizations had some of the most costly data breaches at $188 per record involved. U.S. organizations also charted the highest average total costs at $5.4 million. Additionally, the study found that malicious or criminal attacks are the most costly data breaches, and, at $277 per record compromised, U.S. organizations had the most expensive data breach incidents.



Several factors can help to decrease an enterprise's data breach costs, including having a solid security posture, an incident response plan, and a CISO, or chief information security officer.

Overall, the study pinpointed seven factors that can influence data breach costs. In addition to whether a company had an incident management plan implemented and "relatively strong security posture" when the breach happened, other factors include if a CISO-like executive had overall responsibility for enterprise data protection, if a third-party error was the cause of data loss, if data breach victims were notified quickly, if stolen or lost devices were involved, and if organizations called upon consultants to help resolve the breach.

Draw A Distinction

Eric Ahlm, security research director at Gartner, says there are data security practices (incident response and investigation) and then there is corporate risk reduction (how not to lose more money after the breach occurs). Although there is a correlation between the two, he says, they are also distinctly different and are typically managed by different teams within a company.

A solid incident response practice, he says, should include resources such as partner networks needed to technically conclude that a significant breach happened and to what extent, including in terms of how much data was lost, where, the users involved, and other considerations. "Once the IR [incident response] team has determined the scope and magnitude of the breach, the next steps really come from legal or corporate risk managers," he says.

Be Transparent

The more transparent your organization is about a data breach with clients, affected parties, employees, and national agencies, the better the reaction will be, says Michela Menting, cybersecurity senior analyst at ABI Research.

Timely, updated, and continuous information-sharing about the breach, as well as providing next steps to take, is "very important in mitigating negative perception and preserving good reputation," she says. This doesn't mean organizations must reveal every last technical detail about the breach, but they do need to inform "affected parties what they are doing about it, where they're at, how they plan to fix it and prevent future leaks, and above all be able to respond in a timely manner to requests for information," she says.

What To Do Right Away

Timing can be everything when a data breach is concerned. Fail to act soon enough, and you risk experiencing various repercussions, including losing more data and increased fines. Act too soon, and you may place energy and resources in the wrong places.

Michela Menting, cybersecurity senior analyst at ABI Research, says that immediately after a data breach occurs, you should work to contain the leak by bringing the vulnerable system offline and locking down affected systems. Additionally, depending on your industry and the type of information breached, you should notify any applicable regulatory authorities. Not doing so, she says, could mean facing significant fines. Don't forget to also notify employees so they don't exacerbate the existing breach.

"Generally, organizations should try to undertake some form of digital forensics," Menting says. Collecting and examining log information from security information and event management, unified threat management, IDS/IPS, and other such systems, for example, can prove extremely helpful, she says.

Smaller organizations that lack the resources to run a full investigation should consider hiring a third-party service provider. Remedying a faulty system (whether it's technical or human in nature) is often the next step and may involve applying patches or addressing social engineering factors.

Inform All Parties

Dealing with the internal fallout of a data breach is only half the battle for enterprises. You also need to notify external parties (clients, other organizations, customers, and individuals) affected by the breach.

In addition to notifications, organizations may need to guide external parties through the steps necessary for them to deal with their own potential fallout from the data loss and to pre-empt any backlash, Menting says. "Also, in the case of regulated data, the competent national authority needs to be involved and sometimes even law enforcement," she says.

Ahlm says that although a data breach is a significant event, a company's real loss from a data breach comes from a devalued brand, potential federal and state fines, and the class-action lawsuits customers and other affected parties could file.

Beyond assisting an enterprise in determining the impact of a breach, providing credit-monitoring services to affected users, and setting up notification and help-desk operations, he says, some third-party providers can assist in public relations efforts to "ideally help reduce further losses." P

Know What's Required

Most states have laws concerning data breaches and what organizations must do if one occurs. These requirements typically include specific guidelines concerning notifying affected parties. Falling to do so in a specific time frame, for example, can mean fines that, depending on the breach's magnitude, can soar into hundreds of thousands of dollars. Requirements and fines can also differ depending on the state the affected party resides in. For these reasons and more, many experts advise organizations retain legal resources to stay current on compliance requirements and regulations.

BONUS TIPS:

Plan For The Worst

What can you do to readdress procedures and policies after a data breach? Michela Menting, cybersecurity senior analyst at ABI Research, says you should look at implementing an information governance model that includes steps on how to plan for incident response, backup, and recovery. The model "should also contain preemptive security policies, as well—secure management of mobile devices, secure remote access, etc.," Menting says.

Learn From The Past

To paraphrase the old saying, an enterprise that fails to learn from history is doomed to repeat it. This is true of a data breach. Though you may determine the cause of a breach, if you don't do anything afterward in the way of implementing measures to prevent a breach from happening again, you essentially haven't learned anything. Additionally, if your company simply cleans up the mess that a data breach causes but doesn't dig to discover the cause, you'll be vulnerable to more breaches.

Streamline Data Migration & Storage Consolidation

Improve Your Processes With Informational Awareness & Data Management Tools

Data migration and storage consolidation are constant challenges for data centers, especially for those that are looking to take advantage of big data. It's difficult to know where certain types of information should be stored and whether it's advisable to consolidate storage to save money. Although there are many approaches to these problems, you won't be able to ensure success unless you truly understand your data and how it's used within your organization.

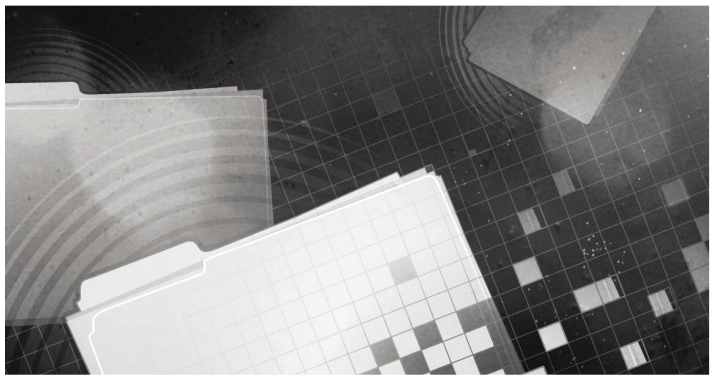
Gain Insight Into Your Data

The best way to streamline data migration and storage consolidation is to get some awareness into your overall storage environment. You have to understand what types of data you have in order to determine the best way to move it and where to move it to. Greg Schulz, senior advisory analyst with the Server and Storage IO Group, says this awareness helps you avoid major migration mistakes.

For instance, if you have 10TB of data that haven't changed in the past year and decide to move it only to find out that you were just reading and using it an hour ago, it could lead to major disruption and impact productivity, Schulz says.

The key is to use solutions that will let you pinpoint the locations of idle data, but to also make sure that it isn't currently in use. This requires sifting through metadata, such as when a file was made, who made it, and when it was last modified, to separate mission-critical data from data that can be moved with little disruption.

"Ultimately, the Holy Grail is to let a tool take care of itself and fully automate or semi-automate these processes, but you have to teach it how to take care of itself and make you feel comfortable that the system will make the smart decision," Schulz says.



Look Carefully At Your Consolidation Efforts

Schulz says that part of your overall awareness needs to be focused on your consolidation plan and whether you want to consolidate based on capacity or IO performance.

He says that some companies get in trouble with consolidation where, "in the quest to free up available storage capacity that might be underutilized so you can hit a performance objective, you may introduce or magnify a storage problem if you consolidate." It's not a matter of opting for inexpensive storage and assuming it'll work for your environment—you have to make sure consolidating a storage solution won't lead to poor performance or other issues.

This same idea applies to data migration as well. You have to consider what will happen to your internal systems if you move data from one location to another, regardless whether it's in use at the time of migration. Companies often use the cloud as a consolidation tactic to free up internal space and move data or applications offsite.

Additionally, make sure that during that migration process, your employees still have access to those files and applications so the migration doesn't lead to unexpected

Key Points

- Know what types of data you have and how they're used to prevent disruption during the migration process.
- Be careful not to consolidate your storage to the point where it negatively impacts performance.
- Consider object storage, which allows for easy migration, even when you introduce new storage technology.

Get Started

For companies that are just getting into big data and trying to optimize their storage, proper migration still comes down to awareness. "Some of that data may be more static than what's taking place in a transactional system," says Greg Schulz, senior advisory analyst with the Server and Storage IO Group. "Maybe the majority of a data warehouse is more static. There, you can start to leverage that knowledge and insight. Are you going to move it all at once or can you start moving, ahead of time, things that are static and don't change? If you can get that running in the background, less time is spent moving data that actually changes."

downtime or lowered productivity. Consolidation can be a big money-saver, but you shouldn't sacrifice performance in the process.

Object-Based Storage

If possible, you may want to consider implementing object-based storage, especially if you perform data migration on a regular basis and can't afford any downtime. This technology is particularly helpful for companies with big data requirements because it allows you to better manage large amounts of information and move it almost at will.

Henry Baltazar, senior analyst at Forrester Research, says, "even though you're changing the underlying storage and replacing hard drives, none of those things really affect what's going on with the environment."

Object storage is like a coat-checking service, Baltazar says. You hand in your coat and get a ticket to get your coat back at a later time. "The whole key to this is that you don't care where your coat is going, because the coat check guy is taking care of it," he says. "You don't care if it's moving from closet to closet or whatever else needs to happen with your coat. You just care that when you come back, your coat better be there."

With object storage, you can move data from array to array, drive to drive, to virtually any location and still be able to access it when you need it. This means that even if you implement a new technology, such as 6TB or 8TB hard drives, you can migrate data and perform non-disruptive upgrades of your background infrastructure, Baltazar says.

Object storage also has a built-in safety guard against hardware failure. "The reason why object storage is popular in a lot of data centers environments is because those environments have the expectation that hardware is going to fail, so it's built with a lot of mirroring capabilities and a lot of migration technologies in place," Baltazar says.

Action Plan

Awareness. The importance of insight can't be stressed enough when it comes to migration and consolidation. If you have tools that can mine metadata and provide insight, you can get closer to streamlining or even automating those processes and removing human error.

The right solutions. Whether it's big data or a more traditional storage environment, you need to put proper management solutions in place that can handle the migration needs of specific data types.

Consider new technologies. If your existing migration and consolidation strategies simply aren't meeting your requirements, don't be afraid to look to new possibilities. Technologies such as object-based storage can be difficult implement at first, but once installed, they can save you money and ease headaches in the process.

Top Tips

Cut costs and improve storage management. Henry Baltazar, senior analyst at Forrester Research, says that companies should factor in the price difference between NAS and object-based storage when considering data migration and consolidation tactics. "You're looking at $3 per gigabyte or $8 per gigabyte on the high end for NAS, and with object storage, we're seeing prices as low as $1 per gigabyte or lower," he says.

Application migration. Baltazar says that companies need to look at app migration very differently than typical file-based migration. While some files may not be accessed on a regular basis, most applications are constantly in use, which means moving them at the wrong time could lead to disruption.

Low-hanging fruit. Greg Schulz, senior advisory analyst with the Server and Storage IO Group, says it's important to go beyond the macro level and look at cleaning up data within applications. He says you "can't go into every single one and waste time pulling out 5MB here or 8MB there," but it's possible to find files that take up a lot of space that are actually full of removable, non-essential data.

Evaluate & Implement Biometric Technologies

What To Consider When Taking A Look At Biometric Security Options

From data centers down to high-end consumer goods (think shiny laptops and new smartphones), biometrics are making a splash.

Biometrics is a resurgent (but not really new) buzzword), and data center managers are being asked to invest in the technology that promises to add still another layer (perhaps the most sophisticated layer yet) of security to their enterprise.

And yet experts point out that this approach may not be a silver bullet, and that—as always—buyers need to do their homework before jumping on this particular bandwagon. As with all technologies, there are things to think about before making any rash moves.

Is This Really The Best Way To Go?

Jim O'Gorman, president of Offensive Security, points out that a purely biometric approach such as retinal scans and fingerprint IDs may not always be the best first choice.

"I would suggest that the organization first look at the use case and ensure that biometrics is really the way to go," O'Gorman says. "There are good reasons why RFID cards and similar are far more popular building access controls, and those solutions should be seriously considered.

Do I Need A Backup Plan?

Systems fail. People make mistakes. Things change, often suddenly, which is why you need a backup plan for biometrics. What do you do about an employee who has cut a finger? Or is wearing an eye patch? Or who for some other reason suddenly finds himself unable to utilize a previously-installed biometric device?

"Obviously you need a fail-safe or backup plan," says James Alexander, senior vice president at Info-Tech Research Group. "So, for employees who physically may be unable to use a particular type of biometrics, be prepared to either implement another one or allow alternate password access. Ditto for cases where devices may suddenly prove to be non-functional. Even if you implement biometrics, you need more than one way to gain access in order to account for such failures and for other unexpected occurrences."

It may seem odd, O'Gorman says, but issues such as the fact that everyone makes physical contact with some types of biometric devices really bothers some people.

That's why O'Gorman sees the best use of biometrics in limited-access locations, where a very limited number of employees are allowed access. Typically this will be a RFID card or similar device that's used to get into a building, and the biometric device itself is then utilized to get into a smaller area. "This helps control the costs by reducing the number of employees that need to take part," O'Gorman says.

Cost Considerations

With biometrics, just like any other IT purchase, you need to consider the whole picture to get a true idea of costs. Sure, you have a quote on devices and installations, but have you thought about other variables? Are you really looking at the TCO, or just a piece of it?

Hidden costs of biometrics can include dealing with the rate of false reads and the time between device failure. Management costs are often ignored as well, including costs that become part of the enrollment process, processes required to secure the data, and so on.

Weaknesses To Evaluate

Biometrics are cool, but imperfect, says Social-Engineer.com's Chris Hadnagy, author of "Social-Engineering: The Art of Human Hacking."

Keep in mind that your fingerprints are everywhere, Hadnagy says. An inexpensive reader installation can be (and many have been) fooled—some by something as simple as some gelatin and a copy of the real fingerprint.

Is fingerprint verification always the way to go? "Is it

cool to unlock your phone?," Hadnagy asks. "Sure."

But to log into a mission-critical cloud account? To give access to purchases? "That I am not feeling too safe about. Personally, I think that there are still way too many vulnerabilities to keep in mind."

The Benefit/Pitfall Balance

As with every other technology decision, one balances risks and rewards.

"The main benefit," says Info-Tech Research Group Senior Vice President James Alexander, "is convenience for end users. In this era of a million different passwords, the one thing you can't forget is your finger or your face. So it not only simplifies things for end users, it also alleviates support calls. In general, almost 50% of calls to corporate help desks are password resets, so that can equate to a big savings."

But there are pitfalls, too, Alexander says. "The biggest issue is false positives, which may allow access to unauthorized users, and false negatives, where I can't authenticate. False positives are the more common and more costly issue, although false negatives actually present the greatest risk.

Risks vary, too, among the various types of biometrics. "Facial recognition can be tough because people's faces do change shapes over time. Meanwhile, there are significant privacy issues with retina/iris scans. Many communicable diseases, as well as pregnancy and even chronic health issues, are detectable through the eyes, and that presents a whole other set of privacy issues. One of the big issues is ease of use. Many facial systems need you to place your face in some kind of fixed stirrup. Iris scans also require a fixed position. Given the nature of the risk you are mitigating, fingerprint scans probably make the most sense." P

Where Should I Use Biometrics?

One major decision involves where and to what extent your enterprise will use biometrics. The best answer? James Alexander, senior vice president at Info-Tech Research Group, says time and attendance is a great application. "You should also consider biometrics for both physical premises access and for workstation login. Of course you need to balance any potential gains with the cost of implementing biometric technologies. If there is no type of built-in capability, you will need to add biometric devices to existing equipment, and there's a cost for that." Alexander says integrating recognition software with other software and login processes, particularly in more heterogeneous environments, could be significant. And don't forget about the cost of ongoing support.

BONUS TIPS:

Is This Really Necessary?

You're interested in (and must be vitally invested in) secure access. The safest way to ensure that, says Info-Tech Research Group Senior Vice President James Alexander, is a threefold approach: "Something I *know* (a password) something I *have* (a swipe card), and something I *am* (biometrics). So having all three is really the most secure approach. Changing from a password to a biometric solution may not make things more secure, but it may ease issues relating to the need to administer and support quality passwords. If a higher level of security is necessary, then implementing two of the three measures is obviously an advantage to risk mitigation, but also a potential drag on productivity and access. As always, it's a balance.

Ensuring A Successful Biometrics Implementation

One big issue with biometrics implementation is integration, not just with all of the different devices and their OSes, but also in terms of all of the different systems. End users today face a great number of passwords to traverse amongst all of the different systems they need to access, so trying to create a biometrically-enabled version of a single sign-on would be much preferred. Of course, the end user is the single biggest point of failure on any technology implementation. Thus, the real key will always be end-user training and access to immediate support when there's an issue.

Build A Private Cloud

Benefit From The Cloud's Flexibility & Management Without Storing Data Offsite

Much of the focus on cloud computing has been on the public space. However, for companies with compliance or security concerns, it's possible to build an internal private environment that provides some of the public cloud's flexibility and management without storing data and applications offsite.

But the private cloud isn't an option for all companies, because it requires considerable upfront costs and the right employee expertise to manage the environment.

People, Process, Technology

Before building a private cloud, take a look at your employees. "You can't take it for granted that this is just going to work like a traditional IT operation," says Ed Anderson, research director at Gartner. The private cloud takes a specific type of expertise, and it's up to you to ask yourself whether your company has the right roles and the right skills to support it. But you also need to consider end users, Anderson says, because they are the ones that will benefit most from a proper private cloud implementation.

From there, consider the processes within your organization. "You need to take into account all of the impacts on the business," Anderson says. "What other organizations are going to be impacted and how will this change the way the business operates?" The private cloud is going to unlock some new capabilities for your organization, and it's important to determine what types of applications or data you want to move to the cloud and how you intend to use it.

If you know you have the right expertise in place and understand what business processes will be affected, you can start to look at your technology and infrastructure. The private cloud will require some mass storage, virtualized servers, and networking devices to access that cloud-based information both inside and outside of the organization. It's possible you may have the proper infrastructure already in place to support a private cloud, but it all depends on how much capacity you'll need now and in the future.

Benefits Of The Private Cloud

One of the biggest disadvantages to the private cloud, when compared to the public cloud or other alternatives, is that you are responsible for all of the technology as well as the management of the cloud itself. But even though the private cloud doesn't necessarily provide an instant money-saving incentive, it does have its own unique advantages.

"The main benefit you're going to get from the private cloud is being able to have greater insight in terms of management and faster resources for your employees," says Lauren E. Nelson, an analyst at Forrester. "You're essentially saving time for your managers and end users, so they can do things faster."

Anderson says the companies that will get the most out of the private cloud are those that have more variability in their workloads. "If you have a pretty static environment that has a very predictable operational profile, then the private cloud will have less

Key Points

- Use the people, process, technology approach when planning your build.
- Understand the true benefits of the private cloud and make sure it's a fit for your company.
- The private cloud is not an ending point. Be prepared to continue down the cloud path and take advantage of future technological advances.

Get Started

Company leaders need to think about incorporating virtualization technologies into their environments to set a foundation for the private cloud, says Ed Anderson, research director at Gartner. Anderson sees this process as a "progression from traditional IT operations up through server virtualization, to more advanced distributed and managed virtualization, progressing to a private cloud." He says having virtualization in place as a foundation will "take care of a lot of the storage and networking issues that will come up with the private cloud."

value to you," she says. This is particularly important for companies that have to deal with compliance. The private cloud lets you move some of that sensitive data to a more flexible environment without potentially sacrificing security like you might with a public cloud.

"You have to understand the real benefit you're going to get from this," Anderson says. "People generally rush toward cloud models thinking they're going to save a bunch of money, but there are other factors introduced along with any cloud model, public or private, that you have to account for and just understand all of the trade-offs."

Not A Final Destination

Before, during, and after the private cloud implementation, you should always be looking forward to what's next for your company and for technology in general. "Most organizations look at the private cloud as a waypoint along their bigger IT journey," Anderson says, which is absolutely crucial if you want to keep moving forward.

You may start with virtualization to get your feet wet before moving on to an internal private cloud deployment. Then, you may decide to move to a managed service "where you still might be running all of those assets in your own data center, but you've offloaded the operational burden to a third party," Anderson says.

From there, you could opt for a colocation arrangement where your infrastructure or a third-party infrastructure is located offsite, but you still have full operational control. Or you may opt for an entirely hosted private cloud environment, which works much the same as a private cloud but can be siloed off from other people's resources.

There are still other options to consider. For instance, John Sloan, principal consulting analyst at Info-Tech Research Group, says that the hybrid cloud is "a real value area for many organizations." It's the next logical step for companies looking to further their cloud computing footprint, because "you can have your cake and eat it, too, in the sense that you can have that private cloud that's internal and then you can have access to an external cloud provider's resources," Sloan says.

A hybrid cloud lets you keep sensitive information in-house, but then opens up the possibility for bursting into the public cloud when you need additional capacity and just have access to additional scalable resources as needed.

The private cloud is a great starting point, but you shouldn't limit yourself to it. You will open up many more opportunities once you have that solid foundation in place. P

Action Plan

Virtualization. One of the best places to start with a private cloud build is to make sure you have some form of virtualization already in place. It serves as a great foundation for the private cloud, which requires virtualized servers, mass storage solutions, and more.

Applications and data. Consider how your employees will use the private cloud and what types of data and applications you want to move over. Use this as a baseline for capacity and demand planning.

Start small. Move over a few pieces of data and a few low-risk applications at first to test out your private cloud environment. Once you feel comfortable, you can move on to other larger-scale projects.

Think ahead. Be in a position to take advantage of hybrid cloud solutions in the future, so you can have your own internal cloud and a more easily scalable external cloud.

Top Tips

Who benefits. Organizations that will benefit most from the private cloud are those that have a diverse set of consumers, groups that utilize corporate IT assets, or variability in their application workloads, says Ed Anderson, research director at Gartner.

Avoid performance issues. Private clouds help you avoid noisy neighbor syndrome in public clouds, where some tenants may see performance drop off because another tenant is sucking up too many resources, says John Sloan, principal consulting analyst at Info-Tech Research Group.

Use an existing solution. Consider using an existing private cloud solution, rather than reinventing the wheel and trying to create your own solution, says Forrester analyst Lauren E. Nelson.

Pinpoint The True Costs Of New Projects & Products

Strategies To Help Identify The Real Expenses & The Returns On Your Investments

Data center managers often dive into new projects or new product or technology implementations without getting a complete picture of all the costs involved.

But failure to dedicate time and resources to R&D can result in a miscalculation of a product's total value or unanticipated project delays. Here's how to gain a better idea of the true costs of a new project or product implementation.

Use ROI The Right Way

Darin Stahl, principal consulting analyst at Info-Tech Research Group, says some companies will get so wrapped up in ROI figures at the time of purchase that they forget to go back and "revisit the results that you realized against the original investment case." But you'll never know how much of a return you saw on your initial investment if you don't monitor performance and compare that analysis to what was promised in the first place.

"You've seen business cases where you say 'in three years, we're going to do this, this, and this,'" Stahl says. "But after three years have gone by, do you actually go back to revisit those to see if that's true? You'd be surprised at how many organizations do not. If that's the case and you don't do it at all, then why bother?"

Cover All The Bases

Clive Longbottom, founder and service director at Quocirca, says attempts to pinpoint a new project or product's TCO often omit several important considerations, including what the new product/process can do for the business and what could occur if the business didn't implement the change but competitors did.

Using a total value proposition approach that addresses these concerns, as well as what the change will mean to individuals and the financial impact a change would have, can be "pretty simple and doesn't require deep dives into information that's probably not available to the person dealing with the issue," he says. Overall, he says, managers can "come up with something that forms the core of a proposal and a plan within a couple of hours."

Focus On Business Needs

Stahl warns that the data center is sometimes so separated from the business itself that purchasing decisions and business plans aren't discussed as much as they are handed down and followed. Instead, Stahl says that data center managers should look at the investment case the business is submitting and suggest equipment that will meet those needs without going overboard on cost.

But in addition to giving the business side advice on what equipment to purchase, the data center manager can also suggest other ways to save money with regard to aging infrastructure.

"In ever so many data centers, there is hardware and infrastructure that was put in place to support the marketing thing of the month," Stahl says.

"Nine years later, they've stopped using them, there are five customers on it that are kind of grandfathered in, and they're just waiting for those records to go away, but I'm still running all this big equipment. Go back to the business and realign. Can I move this workload, stop this workload, or can I run it on a different tier of my service delivery because it is no longer mission-critical? Stop funding that stuff, because ultimately it erodes your ROI for everything else."

Be Balanced

Clive Longbottom, founder and service director at Quocirca, says TCO focuses on costs but "unfortunately, ROI is too amorphous for most people to be able to measure effectively."

He suggests a more balanced approach that involves determining a project's or product's total value proposition (TVP). This entails examining four areas and averaging their scores to get an indication of the true time to return on the investment.

The first area examines what the change will mean

to individuals. Managers can quickly estimate the value to individuals by determining what impact the change will have on the time the individual spends on a task, amount of resources he'll need (more or less than before), and the scope of the task.

The second TVP area is examining what the change would mean to the organization (how will costs or risks change) and what value the project/product will bring the company (can the company sell more at the same or greater margin and can it bring the new product/service to market at a good enough margin).

The third area is what would happen if the company didn't implement the project/product but competitors did, and the fourth area is pinpointing the expected financial impact.

"If we take the processes and tasks as they are now and the processes and tasks as they will be after the change, are we looking at them being a lot more expensive, more expensive, about the same cost, cheaper, or a lot cheaper?" Longbottom says.

Aim For Achievable Goals

Jay Pultz, vice president and distinguished analyst at Gartner, says company leaders shouldn't "get overly heroic to come up with the financials that will perhaps get a business case approved," especially if an ROI figure isn't realistically achievable. He says some solutions may claim to pay you back in less than a year or claim that you'll see ROI in the triple figures. If the ROI of a specific product seems too good to be true, then it's up to you to dig a bit deeper and make sure your expectations aren't too high. He recommends managers simply look at their current and near-future business requirements when making a purchasing decision and avoid purchasing more expensive equipment with capacities and features they may never use.

Move Beyond Efficiencies

One common mistake data center managers make when looking at ROI is to have the blanket goal of doing more with less, says Darin Stahl, principal consulting analyst at Info-Tech Research Group. Because "doing more with less" is a vague statement, it makes it difficult to measure whether a new approach or new piece of equipment is actually making a financial difference.

"If you are going to do more with less, then your business case should describe what you're going to do with those savings," Stahl says. "Are you going to invest in innovation? Don't just describe efficiency, unless you're prepared to trade that off. If I'm just efficient but I'm spending the same amount of money, where's my ROI in that?"

BONUS TIPS:

Consider Cutting Back

To see near-term results in reducing your data center costs, Rich Fichera, vice president and principal analyst at Forrester, recommends companies aim for the low-hanging fruit and start with simpler cost-cutting measures before moving on to larger projects.

"Making changes to the data center and the physical infrastructure, such as virtualization and consolidation, is something they can do that's unrelated to cooling and performance," he says. "Those are more complicated and involve multiple applications and multiple stakeholders. That's more of a cross-IT, cross-company effort. But getting your infrastructure to run more efficiently via better cooling is pretty much the first step."

Don't Look Only At The TCO

Clive Longbottom, Quocirca founder and service director, cautions that TCO in itself can be "a complete waste of time." For example, he says, "say I come to you and say, 'I can implement a tablet for you at a cost of $100,000.' I'd expect your response to be, 'Ouch, that's high. No thanks.' Now, if I come to you and say the same but added 'and I guarantee that your bottom line will improve by $1,000,000 in 12 months purely due to this,' would your response be the same?" That's why you need to look at not just the costs but also the future benefits and returns.

Boost The Security Of Your Wireless Network

Provide Employees, Guests & Contractors The Access They Need Without Compromising Security

The value of enabling a portion of the network to be accessible via wireless-capable PCs, notebooks, and mobile devices cannot be understated for enterprises. Employees can accomplish more without being tethered to their desks; guests, visitors, and contractors can get the access they need; and remote or on-the-road employees are able to access data when and where necessary to help make the organization successful.

But opening up the entire network to any device that supports Wi-Fi is akin to painting a target on your back for cybercriminals and disgruntled employees. To help you get smart about wireless networking, follow these tips with advice from wireless security experts.

Secure Your Wi-Fi

Your wireless network should be secured before it goes live for employees and others to connect, not the other way around, no matter how temporary the connection.

"The biggest thing is to support WPA2 [Wi-Fi Protected Access 2] Enterprise for your corporate clients so that you can authenticate nodes on the WLAN and monitor usage," says Mike Fratto, principal analyst at Current Analysis. Fratto cites the protocol's automated capabilities as one of its most beneficial features.

The personnel tasked with purchasing wireless equipment need to seek out hardware that supports WPA2 Enterprise and avoid any that don't. Fratto also warns against using WPA2 Personal to stand in for WPA2 Enterprise. "[WPA2 Personal] is more difficult to deploy and manage at scale," which means that users and employees may be tempted to take shortcuts that compromise network security.

Tools Of The Trade

When it comes to the support systems for wireless network security, Michael F. Finneran, principal at dBrn Associates, says organizations should take a "walled garden" approach.

"If there is corporate data stored on the device, you should strongly consider a mobile device management solution that maintains a manageable and secure corporate container (sandbox) on the user's device." Finneran says that virtual desktop infrastructure (VDI) can be used to keep corporate data off devices, but only as long as applications continue to work appropriately on those devices.

Fratto recommends organizations maintain a certificate server to validate keys as part of a public-key infrastructure. "Microsoft's [certificate server] will work fine for this purpose. You also need to have an authentication system and Active Directory with RADIUS."

Fratto says Windows Server has tools that make setting up WPA2 Enterprise inexpensive and easy. He says that even though larger organizations may need a more nuanced approach to tackle the increased complexity of configuring Active Directory, it's still not difficult to accomplish.

Golden Rule(s)

Policies and access control are central to the security of your wireless networks. Guest access should be mandatory, but locked down. "Most WLAN products support a guest network complete with a separate sign-in portal so that you can at least notify guests of policies,"

The Cellular Factor

Wireless networking refers to more than just Wi-Fi. Michael F. Finneran, principal at dBrn Associates, says organizations need to treat cellular and Wi-Fi security as separate issues.

"For in-house Wi-Fi, use WPA2 encryption and 802.1x authentication. For access through public hotspots, VPN should be mandatory. Cellular access should also use VPN or equivalent encryption (e.g. SSL)." Finneran also says that companies need to ensure that any data stored on devices is hardware-encrypted and accessible only with a strong password.

Fratto says. "The biggest challenge is ensuring that the guest traffic is isolated from the rest of the network, and VLANs are sufficient to do so." One of the most important things to avoid is making guest WLAN traffic routable internally.

Finneran agrees, saying that limited, identifiable access is core to managing guest access. "Visitors and contractors should be sponsored by an employee who provides their credentials before access is granted," he says. "That access should be limited to Internet access unless there is a compelling reason for something else." Finneran also emphasizes the importance of making guest access expire after a relatively short amount of time.

BYOD Defense

One factor no company can safely underestimate is employees who connect personal devices to the corporate network. As Fratto says, "BYOD changes the game."

The worst thing an organization can do is just let it happen, unchecked. "If the company supports WPA2 Enterprise, then they can treat the [personal device] as any other company owned wireless device and make users register them and log in." Fratto says a viable alternative is to allow personal devices, but only allow them guest-level access.

"With WPA2 Enterprise, any device that can't authenticate to the network is a guest. Some WLAN systems have more robust detection mechanisms, such as device finger printing," he says. "Companies can make and enforce many different policies if they choose to."

For example, Fratto says that BYOD rules should be more relaxed for salespeople who need network access when they travel and meet with clients. Alternatively, those in accounting or HR have less need for access from personal mobile devices and can operate under a more strict BYOD policy. "The catch is making an honest assessment as to what employees need to get their jobs done and satisfy [those needs]."

Finneran says that, when it comes to wireless network security, the organization is responsible for securing corporate data and systems regardless of who owns the device.

"The mobility policy for BYOD should specify clearly what's not allowed on that personal device (e.g., no jailbreaking) and the employee should sign an agreement that they have read, understand, and agree to abide by the policy."

For those in organizations feeling overwhelmed, Finneran recommends seeking professional help in setting policies. "This is a fast-moving area, particularly with regards to issues like the possible need to seize an employee device for e-discovery and potential company liability if the user is in an auto accident while talking on a business call." P

Guest Access: To Monitor Or Not To Monitor?

Monitoring guest access to a wireless network may be necessary, say Michael F. Finneran, principal at dBrn Associates, and Mike Fratto, principal analyst at Current Analysis. But Fratto adds that monitoring guest access may require the organization to store the collected data for a certain amount of time and be able to produce it on a warrant. Pay attention to privacy laws, Fratto says, as some organizations "may be violating privacy laws depending on the depth of the monitoring."

BONUS TIPS:

Keep Wireless Devices Isolated

Mike Fratto, principal analyst at Current Analysis, says wireless security boils down to isolation. "You want to keep devices isolated just as you would on the wired network so that you limit access to intruders and can better support security and QoS policies on a VLAN basis."

Communication Is Key To Enforcing Security

Effective security takes more than just software, hardware, and policies; it takes universal compliance from the employees. The best way to accomplish this, says Michael F. Finneran, principal at dBrn Associates, is to effectively communicate the reasons for the policies that have been instituted. "Security is inconvenient, and people are more willing to cooperate if they understand why these steps are important."

Place Mission-Critical Processes In The Cloud

Is It A Smart Move Or A Dangerous Idea?

Now that businesses large and small are becoming comfortable with the cloud, they're starting to move beyond using the cloud for relatively simple tasks and are considering moving mission-critical processes there.

Is this a smart move? For companies that have already done this, what has their experience been like? How do you go about determining if this is a good option for your company? What are the benefits? What are the potential problems? Here is some advice.

Which Processes Fit Well?

"Reliance on clouds and other hosted services for running mission-critical business processes is not new," says Mark Levitt, director, business cloud strategies at Strategy Analytics.

"For over a decade, many organizations have been entrusting email, conferencing, and CRM to clouds. While many business processes have been handled with on-premises solutions (sometimes managed by third-party service providers), conferencing is one example of a mission-critical business process that has primarily been hosted in public clouds." This makes perfect sense when one realizes that conferencing involves people from multiple organizations in online meetings and webinars.

What is new in the past five years, Levitt says, is the growing reliance beyond software (i.e., applications) as a service (SaaS) to infrastructure as a service (IaaS) for computing and storage. "This represents a far more significant threat to corporate data centers than simply moving individual applications to the clouds, because IaaS could, over the next five to 10 years, render many corporate data centers not just obsolete, but completely unnecessary."

Email is a good example of a process that can move to the cloud, says Tim Hickernell, principal consulting analyst at Info-Tech Research Group. "But the key is resources and competency. What is it taking to run your on-premises emails today? And remember that you're not simply switching a tool, but also any technologies related to (or dependent upon) the tool: Does the switch mean that you're forced to upgrade to a different version of Exchange? If so, there are costs (and lost opportunity costs) involved."

What Are The Real Advantages?

Public and virtual private clouds enable customers to more closely match spending to demand for IT resources. Instead of capital spending on corporate data centers with capacities to support peak levels of demand that are often underutilized, customers can adjust spending upward or downward based on actual usage.

"When there is a need for increased capacity to support new projects or processes, additional capacity can be purchased specifically for the period of time for which it is needed," Levitt says. Taking advantage of aggressively priced public cloud services, customers can buy large capacities for short periods of time for highly intensive computer processing batches, rather than having to lengthen

Mobility & Big Data

Many companies are struggling to keep up with the needs of an increasingly mobile workforce. As more mobile devices require access to data and internal resources, data centers may need to beef up their infrastructure to keep up with demand. The cloud can help, says John Sloan, principal consulting analyst at Info-Tech Research Group. For example, you have the option of creating personal clouds for employees or mobile cloud applications, which opens up new opportunities for mobile data access.

Big data is another major issue where the cloud could prove helpful. Companies are dealing with "very large, heterogeneous datasets that are coming from a variety of sources," Sloan says. And while you may store much of that data onsite, it's difficult to analyze without some outside help. The cloud lets you scale up your resources during a particularly large data analysis project and then scale them back down after you're done.

the time or limit the batch size when relying on corporate data centers. The bottom line is that it allows companies to pay only for what they need.

Is It Reliable? Can I Count On 100% Uptime?

A 100% uptime and security guarantee is a lofty goal, a worthy target for both providers and customers. But promising or expecting a 100% guarantee is unrealistic and will likely disappoint rather than reassure cloud customers who, after all, would never think to offer 100% guarantees for corporate data centers.

"Despite the best efforts of experienced, expert cloud providers using the latest technologies and best practices involving system redundancies and layered protection, software and hardware systems will fail and threat protections will be breached," Levitt says. The real question is how quickly the cloud provider will recover and restart cloud services or identify and contain breaches and data loss. "That's a reasonable question to ask, and that's what customers should be asking of their cloud providers."

How Will The Cloud Affect My Bottom Line?

Whether the cloud proves to be less or more expensive than the existing corporate systems will depend mainly on two factors. First, how cost-efficient are current corporate systems and IT staff? Second, will the desired cloud implementations require a lot of dedicated systems or staff?

"The result of this analysis will likely vary by customer, cloud type, and cloud provider," Levitt says. In any case, whether the costs end up being higher or lower overall should be only one of the considerations for choosing to move applications and infrastructure to clouds.

Move The Right Apps To The Cloud

Regardless of whether you're moving smaller applications or mission-critical ones, you need to make sure your move to the cloud is as smooth as possible. One of the best ways to do this is to make sure to migrate the right data and applications. For instance, sensitive data may not have a place in the cloud because of security concerns, and applications that don't run well on your in-house infrastructure will actually "run much worse in the cloud," says James Staten, vice president and principal analyst at Forrester Research.

"You want to think about an application that is suited to a cloud platform so architecturally it can solve its own reliability issues, where it does not need a highly stable, highly reliable SLA," he says. "And ideally you want applications that fit the economic model of cloud computing."

BONUS TIPS:

Simplify Your Move To The Cloud

There's a concern that moving to the cloud isn't as simple as previously thought. That's why companies that haven't jumped into the cloud need to do their due diligence upfront to make sure they don't enter into a misleading arrangement. Speak to your vendor to see what services it provides, ask what the migration process is typically like, and make sure the provider will help if you run into snags. Be sure to choose the solution that's right for you, rather than trying to make your infrastructure fit the requirements of a specific service. "Cloud computing solutions typically have the advantage of being rapid to deploy with low capital cost barriers up front," says John Sloan, principal consulting analyst at Info-Tech Research Group. "Software-as-a-service can be rapidly deployed and scaled to multiple users without having to buy any hardware and wait to have it installed, configured, and tested."

Security Considerations

Security concerns are one of the reasons companies say cloud computing isn't as easy or seamless as it should be. The first issue is with data security and the transparency of your cloud vendor. Dave Bartoletti, senior research analyst at Forrester Research, says if your cloud provider can't clearly tell you how it is managing your data or what security measures it has in place, then you might want to consider a different vendor.

Configure, Install & Test New Data Center Servers

Successfully Bring New Servers Into Production

Upgrading servers is no small feat. Beyond the scads of configuration considerations that come into play, there's also a bevy of installation and testing details to tend to. Bringing new servers into production is far more complex than simply swapping out the old for the new. The following provides tips and advice regarding the configuration, installation, and testing processes; who should be involved; precautions to take; and more.

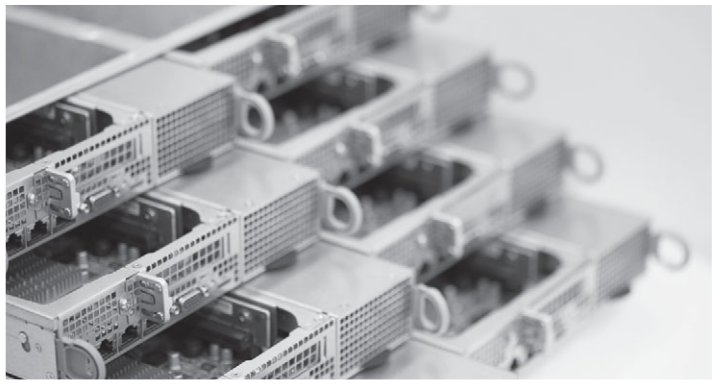
Follow These Steps For Successful Setup

The reality for many small to midsized enterprises is that they don't possess large IT or systems administrator groups. Installing various open-source tools and piecing together different hardware and software components can be challenging, "especially with the software tools that have little or no commercial support," according to Supermicro (408/503-8000; www.supermicro.com).

Another potential hurdle is trying to use hardware from various vendors that may not be designed to work together and can result in project delays and lost revenue. A better approach to upgrading servers is working with a vendor and partner that provides all the key equipment and support necessary and is able to install full-rack and multi-rack solutions, according to Supermicro. Overall, a vendor and its channel partners can offer a good one-stop shop for a complete IT solution.

When it comes to installation, configuration, and testing, Charles King, principal analyst at Pund-IT, advises following the "5W + 1H" formula that reporters and police use during investigative processes. In other words, ask who, what, when, where, why, and how.

"Consider what the goal is and why you're pursuing it, then determine who will perform those tasks, as well as where, when, and how they will proceed," King says. The key is working mindfully and systematically toward achieving a predetermined goal, he says.



Avoid These Common Mistakes

Greg Schulz, senior advisor with Server and Storage IO Group, says that beyond selecting the wrong type of server or selecting a server for the wrong reasons, other common mistakes can include not properly accounting for processor performance, DRAM abilities, I/O for storage and networking expansion capabilities, PCI-E slots and types, management tools, and firmware/software compatibility challenges in meeting application needs. Another common oversight is not identifying and planning for power, cooling, management, and physical facility constraints.

King says one mistake is moving forward without establishing or considering a final destination for the installation, configuration, and testing effort. This occurs most often, he says, if a project is tactically-focused, such as simply spinning up a new business application or scaling a system to support additional users. Another mistake involves companies assuming "past IT solutions will be adequate for new or evolving business problems," he says.

Supermicro says companies that don't own their data center must take the data center environment into consideration as they can't dictate design parameters to meet their

Plan For Growth

Supermicro (408/503-8000; www.supermicro.com) notes that many small to midsized enterprises are "nimble and have high growth rates." Because of this, where server deployment is concerned, "future growth has to be put into consideration," according to Supermicro. "SMEs need to develop a strategy that installs and configures servers in the pace that meets their business growth." From a server, storage, and networking perspective, all key equipment should be benchmarked with the real application to determine if it is capable of supporting the current workload and the growth of the future workload. Overall, a bit of extra investment can go a long way, as many smaller enterprises will outgrow their IT resources, according to Supermicro.

requirements. Rack density, cabling design, power budget, and cooling capacity should be addressed. Supermicro suggests working with an experienced supplier to help speed up server deployment and avoid unnecessary mistakes.

Include Several Groups During Installation, Testing

Bringing a server onboard should involve numerous parties. Installation, for example, should involve facilities or those responsible for primary and standby power, cooling, floor space, and verifying equipment gets from a shipping truck to its final destination, Schulz says.

From a configuration standpoint, he says, those who helped determine criteria for the server selection process should participate in deployment, as should those responsible for OSes, virtualization tools, KVM, storage, networking, and operations/management.

Schulz says different testing levels will involve different personnel. Basic functional tests that ensure the POST runs OK and the equipment is installed per manufacturer instructions might involve the vendor or its VAR or business partners, as well as onsite management or operations personnel, he says.

Another level of testing should entail running benchmarks, workload simulation, or actual customer workloads to verify and validate that the server meets or exceeds customer expectations.

For the configuration process, Schulz says, don't forget to involve those individuals "responsible for networking the server to SANs, LANs, WANs, and MANs," and also involve "whoever will be handling management, configuration, setup, storage, backup, virtualization, and related tasks."

Work Around Limitations

Compared to larger enterprises, small to midsized enterprises typically lack a large supply chain or considerable bargaining power. For example, larger enterprises may be able to request that a supplier quickly remedy a BIOS or firmware bug, but smaller enterprises will need to more thoroughly test and validate servers. "A good approach is to buy only the servers that have been certified with the OS or software applications," according to Supermicro. Be sure to heed application compatibility and OS and driver support, and after putting servers into production, update the driver, firmware, and BIOS to current versions. P

Make Sure You Get What You Pay For

Greg Schulz, senior advisor with Server and Storage IO Group, advises taking several precautions, including having a plan and a process that focus upfront on validating configurations before orders are placed and validating what was shipped vs. ordered. Also set expectations; get concurrence and support from those involved; keep everybody informed of status updates; and allow lead time for power, cooling, floor space, or other items and tasks that require advance notification. "Avoid surprises by planning ahead, learn from mistakes, work those into the plan for future upgrades or installation via continued improvement, and capture that knowledge in a document or some other means," he says.

BONUS TIPS:

Seek Vendor Support

You can expect and get vendor support, either directly or from a representative of a VAR or business partner, upfront during the configuration on through the initial testing and validation phase, says Greg Schulz, senior advisor with Server and Storage IO Group. But if you're only shopping for the lowest-cost server you can find, expect less assistance, he says.

Plan, Process & Communicate

Charles King, principal analyst at Pund-IT, says problems related to server installation, configuration, and testing can generally fall into three categories: planning, process, and communication. Planning refers to issues that arise during a project's preparation phase. Process relates to common and unusual errors made during the installation/deployment implementation. "Communication issues are among the most difficult to address, mainly because they span everything from simple misjudgments . . . to gross or even willful ignorance," he says.

Buying Tips:

Enterprise Mobile Devices

It wasn't all that long ago that the biggest decisions IT managers had to make about mobile devices were the size and cost of a notebook.

Nowadays, you have to deal with notebooks, smartphones, and tablets that are offered in a range of sizes, with varying degrees of power, and with or without touchscreen compatibility and a host of other features. And employees will often like to have some input on the types of devices they are using, because they are often familiar with the interface and form factor. It all adds up to the need to conduct careful research and compare devices on a number of different fronts before you purchase.

Form Factor

A recent report from Forrester Research, "Orchestrating An Enterprise Tablet Strategy That Drives Business Value," found that there are more than 10 distinct categories of touchscreen devices, including fresh options like touch-plus hybrids (tablets with dockable keyboards), convertibles (can go from tablet to notebook modes), and miniature tablets—and these are only categories for touchscreen devices.

"There's no hard-and-fast rule, but there are limits to the number of devices people can comfortably carry with them," the report notes. "Does a tablet device supplant (and completely replace) a laptop, or is the worker carrying a laptop and a tablet? This effect varies by industry, occupation, and company (particularly where legacy applications must be used)."

In many cases, this comes down to talking with managers and employees about what types of devices they need and how they'll be using them.

Platform

You also may need to speak to managers or individual employees about the types of tasks they need to perform and what platform will work best.

"If there are critical applications needed for work, they need to be compatible with the smartphone," says Michael Battista, senior consulting analyst at Info-Tech Research Group. "This is where it becomes more about platform than about the specific phone. A platform with a large app selection will serve a wider range of use cases, regardless of the size of the screen or the clickiness of the home button. This is where iOS has an advantage right now, though Android is catching up quickly."

Service & Support

Ken Dulaney, vice president and distinguished analyst at Gartner, says to look for notebooks and other mobile devices that have solid backing from a reputable vendor with good service and support capabilities. Also, if you'll need them, watch for specific technologies that can be useful in supporting enterprise management and security.

"Don't rely on upgrades, but what you need now," Dulaney says. Another thing to consider when investing in tablets and smartphones is support from the mobile device management (MDM) vendor your enterprise uses, because it will be much more difficult to manage and secure devices that don't conform to your MDM system's capabilities for compliance and corporate policies.

The Extras

Getting the job done with a smartphone or tablet may require some helpful accessories.

"Keyboards, in particular, are often necessary for tablets being used as creation (rather than consumption) devices," Battista says. Some use cases might require other accessories (for example, a cradle for using a tablet as a point of sale terminal, or a thick case to ruggedize the tablet for use in hazardous situations or just to protect it from toddlers when the user brings it home). Make sure the chosen tablet is compatible with necessary accessories." P

Checklist

Talk. Ask workers what mobile devices they are familiar with. For example, it may help if they already own a Windows 8-based PC or an Android or iOS tablet, because they'll be familiar with the ins and outs of how to make it work.

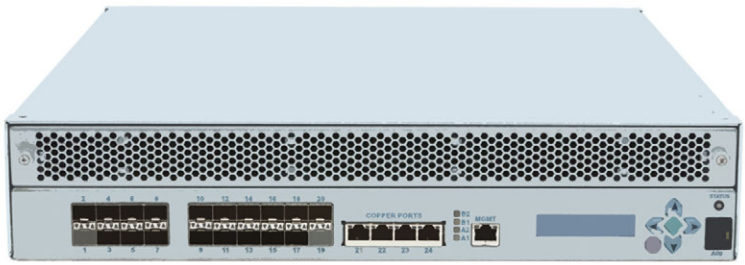
Support. Ensure that any notebook, tablet, or smartphone you purchase can run the applications and mobile apps employees will need to get their jobs done.

Go small. Choose the smallest device that gets the job done. The bigger the device, the less likely the workforce will want to travel with it.

Work all day. Consider how the mobile device will work with monitors and docking hardware, if available, for effective use throughout the workday.

Buying Tips:

Networking Components



For most enterprises, the network is king. High-end servers, racks full of storage drives, and the most state-of-the-art HVAC equipment aren't good for much of anything without a dependable network.

As a result, almost nothing related to an enterprise network is simple. Whether it's deployment, management, or maintenance, working with a vast network is often complicated. Buying new networking components is no different. Here are some tips.

Know The Lay Of The Land

Take the time to thoroughly inspect your existing network infrastructure before you start filling up the shopping cart. One of the worst mistakes you can make is to buy incorrect and/or unnecessary hardware.

"A key first step to improving your network is understanding your current situation," says Aberdeen Senior Research Analyst Jim Rapoza. "Leading businesses know where their current network is providing value and where it is coming up short."

Consider More Than Just Your Current Vendor

It's easy to become complacent if your vendor's networking hardware has done an adequate job. But in some regards, that's exactly what vendors want. As vendors develop proprietary technologies and interrelated ecosystems, it's too easy to fall prey to vendor lock-in if you consider your existing network "good enough."

Mike Fratto, principal analyst, enterprise network systems, at Current Analysis, says to make vendors work to earn your business. "Don't just look at your current vendor as your sole source," he says. "Other vendors want to win your business, so they're going to have migration plans [to go] from whatever you're using to whatever they have. Depending on the size of the deal, they're going to offer you better discounts, as well as training and support, because they want you to be successful and happy."

Buy For Expansion

Although Rapoza recommends making purchases that give your enterprise room to grow, he cautions buyers against thinking they need lots of new hardware right now.

"I think the most common mistake is to fall back on the old 'throw more hardware at it' solution to network problems," he says. "When your applications are often cloud-based, and new devices and systems are accessing networks, that approach isn't likely to succeed. Smart businesses do the work to understand their networking situation and figure out what strategies are likely to succeed."

Fratto agrees. "When you overbuy, you're wasting bandwidth and money," he says. According to Fratto, two common examples of overbuying are simply buying too much—such as more switches than your enterprise needs—or buying into a technology that your enterprise doesn't yet need. For example, Fratto says enterprises may not need to invest in 10GbE equipment if 1GbE hardware will do what they need.

Look To The Future

Although you don't want to invest too heavily in technologies your enterprise won't use in the near term, both Fratto and Rapoza say that anyone in charge of purchasing networking equipment does need to keep an eye on the future. Often, you have to walk a fine line between wasteful spending and future-proofing your network.

"Don't get left behind," Rapoza says. "Top-performing companies understand that new technologies often provide an edge in productivity and business capabilities; they move to take advantage of the competitive boost of these technologies. Track emerging technologies early in their life cycle, even if you don't anticipate implementing a new technology in the near future."

Fratto says the big trend is to start looking at the virtual networking solutions that are out there. "It's time to start evaluating those and getting them out into deployments."

Checklist

Work with what you have. It's possible to forestall a big purchase or limit your expenses by taking advantage of unused features within your existing infrastructure. For example, using a switch's quality of service, traffic queuing, and traffic engineering might help you improve performance, especially with high-priority traffic.

Do your homework. Find out ahead of time how to incorporate new equipment into your existing network. This is especially important if you mix and match vendors.

Think beyond the network. Network upgrades rarely happen in a bubble. When budgeting, factor in everything necessary (especially the physical plant, for instance) to support the new equipment.

Buying Tips:

Get Rid Of Used Equipment

Getting rid of used equipment can be expensive and messy and take time away from other more important projects, which is why it often gets put on the back burner. These tips can simplify the process and help you find a recycling or disposal service partner you can trust.

Establish A Plan

From an IT perspective, dealing with outdated equipment should be part of an overall disposition plan you do within a hardware asset-management program, says Darin Stahl, principal consulting analyst at Info-Tech Research Group. Knowing what to do with outdated equipment should "just be an outcome of your end-to-end hardware asset-management program, and just one of the disposition options. Plug it into the back end of that process and don't make it a one-time event," he says.

Know Your Options

A fire sale is one common way to get rid of used equipment, but many data centers will need to be aware of who they are selling to.

"A less time-consuming method is to sell to one of the many companies that exist by buying used servers and equipment and refurbishing them," says Brett Femrite, director of business development for Rackmount Solutions (866/207-6631; www.rackmountsolutions.net). "Often you will receive pennies on the dollar for this equipment, but normally the buyer will pay to pick it up and ship it to their facility and get it off your hands."

Another option is an asset recovery program, which is a service that performs both the IT asset buyback and the physical hardware recycling. Some vendors will even create a fund for your organization so you can use the money you gain from selling used hardware to purchase recertified equipment when you need new hardware.

Complete A Thorough Audit

"You should identify and know what equipment you have on hand, what's operational, and what's been abandoned or is under- or unused," Femrite says. "You can't do much to get rid of unused equipment until you have completed a thorough audit and identified what can be removed." The inventory auditing process can be tedious, as you'll want to check all equipment, including fans, shelves, cables, and wires.

Know What You Need From A Service Provider

The equipment recycling or disposal service you choose depends on your goals, including security and environmental concerns and whether this is a one-time disposal or something that's ongoing.

A company where data security is mission-critical, for example, will want a provider that keeps detailed records of wiping, reset, degaussing, and destruction of equipment.

Many hardware resellers and disposal services will provide a complete report down to the final destination of the equipment, whether it be a certificate of destruction or information about recycling activity, such as if the equipment was dismantled into parts for other products. Some hardware disposal companies are even audited to ensure compliance. If you want to continually recycle or resell surplus hardware, you may want to look for a service that will set up an ongoing contract with you.

When seeking an asset disposal service, "Look to work with companies with a reputable asset recovery or refurbishing program," Femrite says. "They can often provide help in determining the value and final disposition of your unused IT assets and offer a variety of options to suit your needs."

For example, a disposal service company may be able to tell you if it'd make more economic sense to repair or reconfigure a given product, rather than destroy it or tear it apart for recycling. By maximizing the value of your equipment, an asset recovery service can also help to improve the green status of the company, because you are helping to make hardware sustainable for a longer period of time. P

Buying Tips:

Data Center Furniture

In a high-duty area like an enterprise or data center, you need furniture that's both functional and durable. Here's what to keep in mind as you're comparing options.

Know Your Company

Your company's needs define the furniture you buy. "Some companies need conference room furniture for secure and private consultations, and others, such as network centers, might utilize server cabinets or colocation cabinets and racks," says Susan Wynne, senior sourcing specialist at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net).

Make Sure It Fits The Space

Have a plan, Wynne says. "Know the function of the room. Have in mind a design or layout of the space you're wanting to create. A sketch or draft of the room with the various components in place is helpful."

Know the dimensions of the space and furniture. Also helpful is knowing how a workstation will be used and by how many people to ensure comfort. Be sure to note whether the surface of the furniture has a lip that makes it wider at the top than at the bottom, and don't forget to leave space for drawers to pull out in cabinets or for people to work in front of the furniture.

Marking the space with tape can show you how much space the furniture takes up as well as what kind of walking space will be left over once it's there. If you prefer not to do it yourself, many furniture vendors offer design templates or free space planning.

Research Available Vendors

A solid data center furniture vendor will have a long track record of providing high-quality products and services. That ensures you can view it as a partner and work with the company for years to come.

"You want a vendor that you can invest in for the future," says Eli Hertz, CEO and president of Hergo (888/222-7270; www.hergo.com). "You don't want to deal with a company that will only be around for a one-time purchase."

Check For Quality

Once your budget is established, you can get the best value for the dollars you spend by looking for the best materials for your price range.

For example, the frame makes a big difference in a piece of furniture's durability. Especially for desks, a steel frame with cross supports is going to be the most durable model. As for surfaces, high-density laminate and high-density pressboard are good choices. Wynne recommends spending more money upfront on quality products from a long-standing vendor.

Use Your Space Efficiently

One way to use space more efficiently is to go vertical rather than horizontal, possibly by investing in pieces of furniture that are wall-mountable. "Office and lab space is at a premium," says Kristen Speranza-Diamond, vice president at Hergo. "It's beneficial to go vertical and make the best use of square footage."

Speranza-Diamond says that most necessary pieces of furniture and equipment for data centers are becoming less expensive, "so everyone is upgrading and making the transition to go compact." Manufacturers are putting more advanced technology into smaller packages, which will help you put more equipment into each piece of furniture.

Focus On The Future

Be sure to look for key features, such as height adjustment for chairs or cable management systems for racks. If you invest in modular furniture with swappable pieces, you'll have room for future growth, Wynne says.

Choose furniture that will have a long life span. "You have to know that your current furniture will still be available in six or 12 months should you wish to duplicate or expand," Wynne says. P

Checklist

Seek out quality. Although looking for deals can help companies on a tight budget, sacrificing quality as a result can end up costing more in the long term, especially if buying from vendors that don't offer lifetime warranties on furniture.

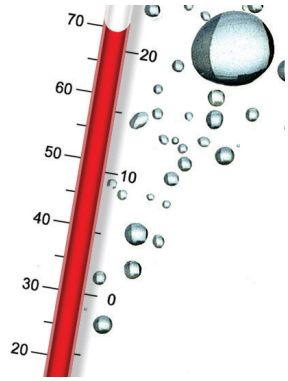
Know the delivery terms. Determine if the delivery includes bringing it inside the facility, requires a lift gate or loading dock, and includes assembly or puts the responsibility on you or a third-party installer.

Go modular when possible. Buying components that are interchangeable lets you modify the setup to meet changing needs, including downsizing or expanding space. Increasingly, individual furniture units can be mixed and matched and layout configurations easily altered.

Build vertically. Purchase components that support building vertically for better space efficiency.

Buying Tips:

Environmental Monitoring Equipment



As a data center manager, you need to have a full understanding of not only what's happening with your network and servers, but also the environment around them. Environmental monitoring is key, but every organization has unique infrastructure limitations, climate issues, and monitoring needs, so there's no one-size-fits-all solution. Here's what to look for.

Define Your Needs & Threats

Laura Viars, account manager at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net), says you need to know what types of threats might occur. "The most common environmental risk is excessive heat within the cabinets, so you'll definitely want to make sure you are monitoring temperature," she says. Other potential environmental dangers include power surges/loss of power, humidity, smoke, airflow, and room/cabinet entry.

"Know thy facility," says Michael Sigourney, senior product specialist at AVTECH (888/220-6700; www.avtech.com). "The first thing an IT or facilities manager needs to consider and create is an understanding of the basic layout and elements, both structure and equipment, within their facility. Knowing where threats are likely to occur or have occurred in the past is key to planning success."

Don't Neglect Hot Spots

When deploying environmental monitoring controls, consider the room size and amount of equipment to be monitored and plan the number and placement of sensors accordingly.

"If your deployment is small, a few points of measurement may suffice, but if you have a large operation, you may require environmental measurements every few feet," says Brandon Siri, senior marketing representative at Server Technology (800/835-1515; www.servertech.com).

Mo Sheikh, sales and marketing manager at ITWatchDogs (512/257-1462; www.itwatchdogs.com), says administrators often overlook hot spots. This can lead to intermittent or permanent equipment failure.

You need to position sensors throughout a facility, usually the top, middle, and bottom of server racks and around any heavy-duty machinery, he says. Buy sensors specifically made for rack-level temp/humidity monitoring and be sure you can daisy-chain the sensors rack-to-rack for easy installation and ease of use.

Know Your Monitoring & Notification Options

Bob Douglass, vice president of sales and marketing at Sensaphone (877/373-2700; www.sensaphone.com), says an environmental monitoring system is nothing without notifications. "The primary motivation for adding an environmental monitoring system is to know when you have a problem as soon as possible," he says. Common notification options include email, LEDs, audible alarms, beacons, sirens, Web alerts, SNMP, automated phone calls, and SMS.

Sheikh says environmental monitors should support SNMPv3 to be able to securely monitor and control sensors and settings on any unit from a remote location and receive alerts and log messages that are fully encrypted.

Get All You Need

Be sure you get all the components to complete the system, Viars says. "Most systems have a main console, and in addition to that, you'll need to purchase various sensors based on what you are looking to monitor specifically." Some sensors might require a power source, so consider that when planning your layout.

Sigourney says that the best solutions include software. "This prevents wasted time trying to get hardware and software from two vendors working together."

Consider Long-Term Support

Choosing the right solution means little if you don't have long-term support, Sigourney says. "Look beyond the checklist and make sure that you're getting future enhancements, that you have access to support, and that the company stands behind its products." P

Checklist

Know what to monitor. What are your greatest environmental concerns? Water? Temperature? Humidity? Are the systems you'll be monitoring remote or local?

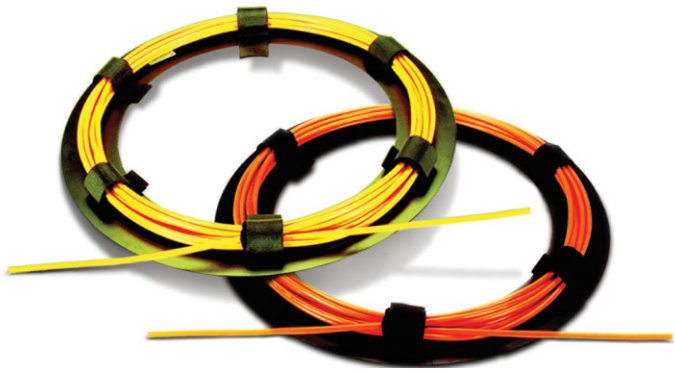
Check for limits. Do you have wired networking or power limitations? Will the environmental monitoring devices connect via network, USB, Wi-Fi, or cellular?

Understand notification options. What kinds of notifications do you need? Common options include email, SMS, and automated phone calls.

Consider your facility. How many and what types of sensors do you need? Where will they be placed?

Buying Tips:

Cable & Airflow Management



Managing cables is an afterthought. That's an unfortunate reality among many data centers, says Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com). Among other things, poor cable management leads to performance problems and issues with troubleshooting and airflow.

Know What's Available

Well-designed patch cable managers, which house and cover patch cords between patch panels and devices, are a popular options, says Brett Femrite, sales manager at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net). He says they are functional in helping reduce cable sprawl, and they are also bend-radius-compliant and offer cosmetic appeal.

Other cable management options include horizontal and vertical wire managers (which can be mounted on the front or rear of your rack or cabinet), cable ladders, cable trays and conduits, and wire minders or rings that can be mounted on any rack system.

Vertical and horizontal lacer bars are also very popular, Femrite says. "These bars can be mounted on a rack or within a cabinet and have slots through which Velcro enclosures or cable wraps are routed to hold groups of cable," he says.

Use Cable Management Bars

Rodger Baldwin, executive account manager at Rack Solutions (888/903-7225; www.racksolutions.com), says that most data center cabinets include cable management bars in the back of the cabinets. "These vertical bars provide a simple method to route, fasten, and organize the cables. Too often, cable installers will opt not to utilize the cable management bars and will simply drop cables unsecured because they believe it is complicated and time-consuming to fasten them. This is just not true."

Baldwin says one cost-effective method for securing these cables is to utilize Velcro straps in place of cable ties. "A Velcro cinch strap can be purchased for just a few dollars. Most vertical wire management bars have cut-outs which allow for easy access for Velcro to be used to secure the cabling within a rack."

Consider Color & Labeling

Koty says color coding can help identify and trace cables and simplify management. With data cables, use color to identify the cable's role/function or connection type. With power cables, use color to identify and organize dual power feeds for redundant power sources. Secure labels so they're accessible but difficult to remove. Also, maintain a spreadsheet that identifies the cables and colors, where cables come from and go, and configurations.

Plan For Expansion

Laura Viars, account manager at Rackmount Solutions, says to be sure your cable management configuration allows for future equipment additions. Do this by making certain managers (both in-rack cable managers and external trays and ladders or conduits) don't meet or exceed their fill capacities. Most management options are available in multiple sizes, she says, ensuring a fit with plenty of excess if needed.

Also seek solutions with the flexibility to add new equipment or troubleshoot an existing component. "Lean toward reusable options such as Velcro straps in lieu of cable ties and managers that allow easy access to their contents," she says.

If you expect rapid and near-term growth, keep cables loosely organized during implementation by cutting down on the bundling and by using managers (D-rings vs. managers with covers) offering easier access. P

Checklist

Know what you need. One of the biggest problems with airflow management is cables, says Craig Watkins, product manager at Tripp Lite (773/869-1234; www.tripplite.com). Make sure the cable and airflow management tools you buy route cables off to the sides, away from the air intake of the mounted equipment, he says. Also remember that air will take the path of least resistance. "Block off the open spaces and force the air through the equipment, not around it."

Optimize cabinets for cooling. "One of the least expensive methods for improving cooling efficiency is to install blanking panels in cabinets to fill in empty space on the front side of the cabinet," says Whit Wilson, senior engineer at Rack Solutions. "Filler Panels are used to control the airflow inside server racks. Without the use of filler panels, the hot exhaust air from the servers can be recirculated through the server and significantly reduce the cooling efficiency of the system."

Network With Your Peers

At These IT Training & Association Meetings Across The United States

DECEMBER

DevOps Live
Dec. 17
6 p.m.
Dallas, Texas
www.devopslive.org

AFCOM Greater Tampa Bay Chapter
Dec. 18
12:30 to 4 p.m.
www.tampabayafcom.com

ISSA Baltimore
Dec. 18
Concurrent Technologies Corp.
8530 Corridor Road
Savage, Md.
www.issa-balt.org

2014

JANUARY

AITP Washington D.C.
Jan. 9
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

AITP Long Island Networking & New Member Event
Jan. 23, 5:30 to 8:30 p.m.
The Northport Yacht Club
11 Bluff Point Road
Northport, N.Y.
www.AITP-LI.org

FEBRUARY

BICSI Winter Conference
Feb. 2-6
Rosen Shingle Creek Resort
Orlando, Fla.
www.bicsi.org/winter

AITP Washington D.C.
Feb. 13
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

Wearables DevCon
Feb. 25-27
San Francisco, Calif.
www.wearablesdevcon.com

MARCH

AITP Washington D.C.
March 13
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

Big Data TechCon
March 31-April 2
Boston, Mass.
www.bigdatatechcon.com

Do you have an event you'd like to see listed?
Send an email to feedback@processor.com.

PROCESSOR Solutions Directory

Here are brief snapshots of several companies offering products designed for the data center and IT industry. Listings are sorted by category, making it easy for you to find and compare companies offering the products and services you need.

You can find more detailed information on these companies and the products they offer inside this issue.

To list your company and products, call (800) 247-4880.

Physical Infrastructure

AVTECH

AVTECH Software, founded in 1988, is focused on making the monitoring and management of systems, servers, networks, and data center environments easier. AVTECH provides powerful, easy-to-use software and hardware that saves organizations time and money while improving operational efficiency and preparedness. AVTECH products use advanced alerting technologies to communicate critical status information and can perform automatic corrective actions.

Products Sold:

A full range of products that monitor the IT and facilities environment, including temperature, humidity, power, flood, room entry, and UPS.

(888) 220-6700 | www.AVTECH.com

Physical Infrastructure

AUSTIN HUGHES

Founded in 1995, Austin Hughes Electronics Ltd. is a design and manufacturing group that offers a broad range of solutions based around 19-inch rackmount technology. With a wealth of experience, Austin Hughes design and development teams are focused to rapidly transform customer requirements and market trends into saleable solutions.

Products Sold:

- Infra solution Cabinet Smartcard Handles
- InfraPower Cabinet Intelligent PDUs
- CyberView Rackmount KVM & LCD Console Drawer
- Environmental Sensors

(510) 794-2888 | www.Austin-Hughes.com

Physical Infrastructure

Server Technology
Quality Rack Power Solutions

Server Technology is committed to the PDU market with the largest group of engineers dedicated to power distribution and other solutions within the equipment cabinet. Advancements in device power monitoring help data centers monitor and improve their efficiency, and continuous research and development is fueled by companies that look to Server Technology for their custom cabinet power solutions.

Products Sold:

A complete line of cabinet PDUs, including Per Outlet Power Sensing (POPS), Rack Mount Fail-Safe Transfer Switch, Console Port access with remote power management, Switched, Smart, Metered, Basic, and -48 VDC

(800) 835-1515 | www.servertech.com

Physical Infrastructure

SENSAPHONE
REMOTE MONITORING SOLUTIONS

Sensaphone has been designing and manufacturing remote monitoring systems for more than 25 years and has more than 300,000 of its products in use. Sensaphone's product lineup offers a full range of devices with a broad number of features and applications designed to monitor your entire infrastructure and alert you to changes. All product engineering functions, including hardware and software design and circuit board layout and assembly, are performed at the Sensaphone facility in Aston, Pa.

Products Sold:

Remote monitoring solutions that provide email and voice alarm notification for problems related to temperature, humidity, water detection, power failure, and more.

(877) 373-2700 | www.sensaphone.com

Physical Infrastructure

SIMPLEX ISOLATION SYSTEMS

Since 1979, Simplex Isolation Systems has been setting new design standards in modular expandable cleanroom components, isolation curtains, hardware, and new product development. Fontana, Calif.,-based Simplex's unique strip doors and mounting systems are designed for quick installation. Simplex parts and materials perform with optimum efficiency, last longer, and save you money. And with Simplex, you are always backed by industry expertise, product knowledge, and the best warranties in the market.

Products Sold:

- Cleanrooms
- Enclosures
- Strip doors
- Curtains

(877) 746-7540 | www.simplexisolationsystems.com

Physical Infrastructure

BayTech was founded in 1976 and, since the 1990s, has developed unique products for remote power management. The company uses printed circuit board instead of wires for a better, more resilient connection between the data center equipment and the receptacle. BayTech provides an extensive Web site with brochure downloads, warranty information, and reseller support and also offers evaluation units for data centers.

Products Sold:

- Power control, distribution, management, and metering
- Power transfer switches
- Console management and remote site management

(800) 523-2702 | www.baytech.net

Physical Infrastructure

LINDY USA specializes in cables, adapters, electronics, and accessories for computer, networking, and audio video applications. Since 1932, Lindy has supplied high-quality interconnects to customers in commercial, telecom, and residential markets. What sets us apart is our complete dedication to innovation, performance, and reliability. Our cabling products are truly outstanding.

Products Sold:

- Networking Products
- Sharing, Converting, Extending
- Hardware and Security
- Cables
- Audio / Video
- USB and FireWire
- Add-On Cards
- Adapters
- KVM
- Input Devices
- Power
- Much more!

(888) 865-4639 | www.lindy-usa.com

Physical Infrastructure

Black Box is a leading technology product solutions provider that helps customers build, manage, optimize, and secure their networks. The company is a single source for cabling, cabinets and racks, localized cooling, power and surge protection, environmental monitoring, and more. Black Box also offers a best-price guarantee and FREE, live, 24/7 U.S.-based Tech Support.

Products Sold:

- Acoustic IT Enclosures
- Cabinets & Racks
- Cables & Patch Panels
- Console Servers
- Cooling
- Datacom
- Industrial
- Infrastructure Hardware
- KVM
- Networking
- Power
- Remote Monitoring

(877) 877-2269 | www.blackbox.com

Physical Infrastructure

Tripp Lite is a leading manufacturer of products that power, connect and protect computers and other electronics. Founded in 1922, it is best known for its Uninterruptible Power Supply (UPS) Systems and Isobar® Surge Suppressors (with over 18 million sold).

Products Sold:

- UPS Systems
- Cables
- Power Inverters
- UPS Batteries
- Surge Protectors
- Racks & Enclosures
- PDUs
- KVM Switches

(773) 869-1234 | www.tripplite.com

Servers

ServerMonkey stocks and delivers new and refurbished servers and networking equipment. Our blend of low prices, high quality, and exceptional service offers a unique opportunity for corporate IT groups to economize without compromising.

Products Sold:

- Dell, HP, and other Servers
- Workstations
- Storage
- Processors
- Server Accessories

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Physical Infrastructure

For more than 30 years, the industry has trusted Alber with their mission critical batteries. Power interruption in any business means lost revenue. Are you willing to risk not knowing if the batteries will perform when needed? With Alber you'll eliminate these unnecessary risks, while benefiting from reduced maintenance costs, and increased safety. Alber's battery management solutions give you the confidence of knowing you're not leaving business continuity to chance.

Products Sold:

Cellcorder CRT-400, Universal Xplorer Industrial Monitor (UXIM), Universal Xplorer Telecom Monitor (UXTM), BDSU-50 (Datacenter Monitor), DC Load Banks, Battery Capacity Test System (BCT-2000), BDS-40, BDS256-XL, MPM-100

(800) 851-4632 | www.alber.com

Physical Infrastructure

RACKMOUNT SOLUTIONS

Rackmount Solutions' mission is to listen to the IT engineer's specific needs and deliver superb-quality, high-performance products through continuous product innovation and operational excellence. We pride ourselves in providing quality customer service, products that fit your IT requirements, and solid value for your money.

Products Sold:

- Wallmount and server racks and cabinets
- Desktop/tabletop portable racks
- Shockmount shipping cases
- Bulk cable

(866) 207-6631 | www.rackmountsolutions.net

Physical Infrastructure

hergo® TECHNICAL WORKSPACE SOLUTIONS

Based in New York City, Hergo Ergonomic Support Systems is an independent designer and manufacturer of enclosure cabinet solutions, technical computer furniture, and modular racking systems. The company's products are designed to promote organization in the workspace and to increase the productivity of computers, peripherals, and communications equipment. Hergo is known for its high-quality products and superior customer service.

Products Sold:

- Racks
- Enclosures/cabinets
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- Flat-panel arms
- Computer desks
- Cable management
- Power management

(888) 222-7270 | www.hergo.com

Physical Infrastructure

HM CRAGG
Quality People. Quality Power.

As an integrator and master distributor providing quality power solutions, HM Cragg has built a reputation as the company that delivers innovation to aid and satisfy its customers. HM Cragg was founded in 1968 and is 100% employee-owned, focusing on quality people and exceptional products.

Products Sold:

- AC and DC power solutions (UPSes, power distribution)
- Control and monitoring (environmental and power)
- Connectors and cables (cord sets, ePDU cables)
- Cooling and Racks (airflow management, portable cooling)

(800) 672-7244 | www.hmcragg.com

Physical Infrastructure

PDU Cables™
Innovator in data center efficiency

PDU Cables is the leading supplier of power distribution cables assemblies to data centers in North America. PDU Cables has been serving this industry since 1981 and is the first independent cable assembly company to introduce colored conduit into the power distribution cable market, the first to get UL 478 listing, and the first to introduce the Power Cable and Equipment Configurator software tool. The company is centrally located in Minneapolis, Minn., allowing it to offer 24-hour turnaround and shipping time of just one or two days to almost any United States destination.

Products Sold:

A range of power cables, cable seals, and power cord assemblies.

(866) 631-4238 | www.pducables.com

Physical Infrastructure

TOTAL CABLE SOLUTIONS

Total Cable Solutions (TCS) provides a wide range of products from copper keystone jacks to custom bundled fiber cables. All products are manufactured with TCS' highest quality, in factories that are ISO-9001 and TUV Certified. All of our cable lines meet or exceed EIA/TIA RoHs standards.

Products Sold:

- Fiber patch cords
- Pre-terminated multi-fiber trunk cables
- CAT5e and CAT6 patch cables
- Fiber and copper patch panels

(888) 235-2097 | www.TotalCableSolutions.com

Physical Infrastructure

Rack Solutions®

RackSolutions has been serving the data center market for more than 10 years. All of our products are designed, engineered, built, and shipped under our own roof. We have product solutions available for every major OEM, but if one of our existing products doesn't fit your needs, our top-notch mechanical and electrical engineers can create the item you need from scratch, solving even the toughest installation design challenges. Best of all, we typically don't charge up-front fees for design services.

Products Sold:

- Computer Server Racks
- Cabinets and Shelves
- Mounting Products

(888) 903-7225 | www.racksolutions.com

Storage

Founded in 1994, Paragon Software Group is an innovative software developer focused on two markets. The company's comprehensive product line for the data storage market addresses the needs of data security, storage, and management for PCs, servers, and networks. A second portfolio of products focuses on mobile productivity applications for handheld devices. Paragon Software Group has offices in the United States, Germany, Japan, Poland, Russia, and China delivering its solutions to consumers, small business and enterprise clients worldwide.

Products Sold:

- Backup and Disaster Recovery
- Imaging, Migration, Deployment
- Partition Management

(888) 347-5462 | www.paragon-software.com

Servers

Chenbro is a leader in enclosure solutions, selling its products primarily to system integrators and OEM and channel partners. The company's extensive research and development efforts help it to keep its competitive edge and maintain market leadership, with special focus on thermal, EMI, and acoustic solutions. Taiwan-based Chenbro has offices in the United States, UK, The Netherlands, and China.

Products Sold:

- A comprehensive line of PC chassis, server/workstation chassis, rackmount chassis, and HDD enclosures.

(909) 947-3200 | www.chenbro.com

Servers

Supermicro® (NASDAQ: SMCI), the leading innovator in high-performance, high-efficiency server technology, is a premier provider of advanced server Building Block Solutions® for enterprise IT, data center, cloud computing, HPC, and embedded systems worldwide. Supermicro is committed to protecting the environment through its "We Keep IT Green®" initiative by providing customers with the most energy-efficient, environmentally-friendly solutions available on the market.

Products Sold:

- Servers
- Motherboards
- Chassis
- Network switches
- Storage solutions
- Blade servers
- GPU servers
- Embedded

(408) 503-8000 | www.supermicro.com

Clients

Brady Corporation is an international manufacturer and marketer of complete solutions that identify and protect premises, products and people. Its products help customers increase safety, security, productivity and performance and include high-performance labels and signs, safety devices, printing systems and software, and precision die-cut materials. Brady is headquartered in Milwaukee and employs more than 6,900 people at operations in the Americas, Europe and Asia-Pacific.

Products Sold:

- Industrial labels, printers and software
- Safety and facility identification
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(800) 541-1686 | www.bradycorp.com

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Products Licensed:

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- Web with Spider
- Engine for Win & .NET
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- Cloud & Virtual Hosting
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In 1987, Pegasus Computer Marketing started providing mainframe products to the end-user market. What began as a sales-only organization soon adapted to offer in-house repair and refurbishment. During the past 10 years, Pegasus has focused primarily on the point-of-sale and barcode industries, buying, selling, and providing service contracts for anywhere from a few scanners to hundreds.

Products Sold:

We buy, sell, and service:

- Point-Of-Sale Equipment and POS/PC Flat Panels
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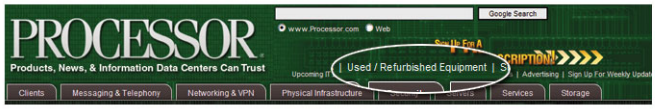

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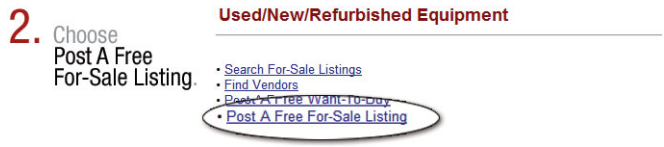

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